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DETROIT

Automotive Daily News

★CARS★ SHOP EQUIPMENT TRUCKS ★★AVIATION★★ PARTS ACCESSORIES ★TIRES★

Vol. 13. No. 1720 — Entered as second-class matter Aug. 27, 1925, Post Office, N. Y., N. Y., Under Act of March 3, 1879. — NEW YORK, TUESDAY, MAY 3, 1932 — 5 Cents. $12 Per Year.

S. A. E. Outlines Program For Summer Meeting at White Sulphur Springs

Many Technical Papers Scheduled for Discussion; Usual Golf Tournament Also To Play Big Part

New York, May 2.—The program for the annual summer meeting of the Society of Automotive Engineers, which will be held at White Sulphur Springs June 12 to 17 inclusive, has been announced at organization headquarters here. The program, which is of course subject to revision, now stands as follows:

SUNDAY, JUNE 12

Special trains arrive in time for breakfast.

GENERAL SESSION

A talk that will appeal to the entire industry.

MONDAY, JUNE 13

Transportation

Practical discussion of the use of trailers with motor trucks.

Engine and Frame Design

Design of bearings and connecting rods.

Deigning frames with reference to car stability.

TUESDAY, JUNE 14

Motor Trucks

Power brakes for trucks and trailers and their present problems.

Business Session

"Madhouse Motors," an event

(Continued on Page 2)

MARCH CAR-TRUCK SALES TOP FEBRUARY

Detroit, May 2.—With reports of new car registrations during March available from all but three states—Kansas, Colorado and Wyoming—an increase in sales over the preceding month is reported by R. L. Polk & Co., compilers of official automobile registrations.

Sales of new passenger cars in forty-five states, representing 96.67 per cent. of the entire country, totaled 89,442 units, an increase of 12.43 per cent. over sales of 79,549 units in the same states in February. The March sales show a decline of 53.9 per cent. under sales of 194,153 units during March a year ago in the same states.

The Polk estimate for the total March sales in the entire country is 92,522 units, as compared to 81,853 units in February, 1932, and 200,841 units in March, 1931.

(Continued on Page 2)

DAHL AND KELLY NAMED DIRECTORS OF WHITE COMPANY

Cleveland, O., May 2.—At the annual meeting of stockholders of the White Motor Company, held here, all members of the existing board of directors were re-elected and T. R. Dahl and George H. Kelly were elected as additional members.

The board is now composed of R. W. Woodruff, chairman; A. G. Bean, Charles L. Bradley, Warren S. Hayden, Otto Miller, Homer H. Johnson, J. R. Nutt, E. W. Stetson, Walter C. Teagle, E. R. Tinker, W. King White, T. R. Dahl and George H. Kelly.

Following the stockholders' meeting directors re-elected A. G. Bean as president and all other present officers of the company.

T. R. Dahl has been with the White Company for more than twenty years, and at the present time is vice-president and secretary of the company. He is regarded as one of the foremost authorities in the country on motor transporta-

(Continued on Page 2)

ILLINOIS APRIL SALES TOP MARCH

Springfield, Ill., May 2.—Sales figures for the state of Illinois for the month of April, 1932, have just been released here, the first state to report. Passenger car sales in April this year amounted to 7,982 units. This compares with 5,376 in March, 1932, and with 17,004 in April, 1931.

Truck sales in April this year were 781, as against 780 in March. In April, 1931, truck sales totaled 1,775.

Chevrolet New Car Sales Show Sharp April Gains

Detroit, May 2.—Chevrolet dealers reported the sale of 19,672 new and 35,322 used cars to retail buyers in the second ten-day period of April, H. J. Klingler, vice-president and general sales manager, announced today.

This is a gain of more than 2,000 new and 9,000 used cars over the first ten days of the month, and is the best ten-day period enjoyed by the company since last August, Mr. Klingler said.

In the second reporting period of April, dealer stocks of used cars were reduced by 2,320 units. Since March 1, when an intensive used car campaign was opened by Chevrolet, dealers reported the sale to retail buyers of 147,000 used cars up to April 20.

Sale of new cars in the first two periods of April were in excess of 38,000 units.

Mr. Klingler attributed the gains to four major factors: The aggressive campaign Chevrolet is now waging to stimulate sales, the regular seasonal upturn usually evident at this time, the stimulation due to recent price reductions, and the benefit being derived from the national exhibits held by General Motors in fifty-five leading cities early in April.

April Car and Truck Output Estimated at 145,000 Units

Total Represents Gain of 16 Per Cent. Over March, But Is Less Than Half of April, 1931; Upturn Seen for May

New York, May 2.—Automotive Daily News has just completed its usual monthly check-up of production activities in the industry. From the figures that the manufacturers have given us by wire, it appears that about 145,000 vehicle units were turned out by our factories in April. This runs about true with estimates made during the month by more or less well qualified experts.

April production began to show the first effects of activity at the Ford plant in turning out the new models. The Ford production, however, was not in sufficient volume to lift operations of the industry as a whole anywhere near last year's levels. In May there will be a different story.

The 145,000 vehicle units turned out in April, 1932, compare with 127,277 in March, 1932, and with 354,098 produced in April of last year. The gain in production of April over March this year works out at approximately 16 per cent. The total for April this year represents a decrease of more than 59 per cent. under the record of April, 1931.

In all probability production figurges for the next few months, as Ford swings into higher output, will show a very encouraging betterment over the comparisons, as well as the actual statistics of the first four months' returns. Automotive Daily News is conducting a canvass of contemplated production schedules for the month of May and will shortly present the results to its readers.

READING R. R. BUYS FIRST RUBBER-TIRED STAINLESS STEEL CAR

Philadelphia, May 2.—The Reading Railroad will shortly operate the first stainless steel, pneumatic-tired rail car of the Budd-Michelin type in this country, according to an announcement made yesterday by the Edward G. Budd Manufacturing Company.

The railroad has entered its order for a new fifty-six passenger, pneumatic tired, stainless steel rail car, powered by an eighty-five horse power Diesel motor. The car will be placed in service between Princeton and Trenton, N. J., and may also be used experimentally on other parts of the Reading system. The order for the rail-car was placed by C. H. Ewing, who was elected president of the Reading only last week.

"The Reading will be the first road in this country to use one of these new rail-cars in actual service," Budd officials pointed out. "The French roads are already using a rubber-tired Michelin rail-car. We have been running our original Budd-Michelin car at ir-

(Continued on Page 8)

MAKERS OF CARS CHIEF SUSTAINING STEEL INFLUENCE

Youngstown, May 3.—Automobile steel buying continues to be the chief supporting influence of Youngstown district steel plant operations, although large-scale purchasing by leading automobile manufacturers still is being postponed. Production of pipe and other leading iron and steel articles manufacturers here has tapered in the last few days, hence fabrication of steel into strips, sheets and bars for the automobile manufacturers provides most of the valley activity.

One valley steel company resumed operations at a sheet plant yesterday and other makers anticipate higher schedules before the week ends. Despite this improvement, however, ingot production in the Youngstown district still is estimated at 28 per cent. of capacity by valley trade authorities. This is equal to the average rate of ingot

(Continued on Page 8)

RUBBER IMPORT TAX PROPOSED IN SENATE

Washington, May 2.—Having voted a manufacturers' sales tax of 5 per cent. on passenger cars, 3 per cent. on trucks and 1 per cent. on parts and accessories in the new tax bill, the Senate Finance Committee today was giving serious consideration to a proposal to impose an import levy of 5 cents a pound on crude rubber.

Such a tax on crude rubber, it

(Continued on Page 2)

U. S. RUBBER BOOSTS MAY SCHEDULE 15% ON FIVE DAY WEEK

Detroit, May 2.—Beginning today the tire department of the United States Rubber Company increases operations to five days a week, with three eight-hour shifts a day. Thus far this year the department has been working an average of four days a week.

The May production schedule calls for a 15 per cent. increase in tires, according to J. F. O'Shaughnessy, general manager of the tire department. This increased schedule will mean many more hours of work for the employees now on the pay roll, and it will necessitate the recall of a few former employees.

"At the rate orders are now coming in from both car manufacturers and tire dealers, I believe June output will surpass that of May by another 15 per cent.," said Mr. O'Shaughnessy, "and I see no reason why we should not continue at near capacity throughout July."

Mr. O'Shaughnessy said that approximately 3,000 men were at work at present, and that this was close to a normal pay roll. He explained that it is the policy of the company to shorten hours rather than dismiss men, and for that reason the increased operations would not mean the recall of many workers, simply because there are not many who have been laid off.

Indications of the popularity of the new low pressure tire which the company is now building is reflected in the fact that men in that department are now working seven days a week.

KY. TRUCK LAWS EFFECTIVE JUNE 18

Frankfort, Ky., May 2.—Cliff Claypool, commissioner of motor transportation, today notified firms and corporations engaged in the business of operating trucks and buses for hire that bus and truck laws enacted by the recent session of the General Assembly would become effective June 18.

As soon as possible after that date

(Continued on Page 3)

Federal Adds New 8-Ton Six-Wheeler, Priced $3,895

Detroit, May 2.—An eight-tonner is the latest six-wheel product of the Federal Motor Truck Company. The development of this model is the result of the success of the three-ton and the four and five-ton six wheel vehicles.

The new model is designated as the T1OSW. Like other Federal single drive six-wheelers, the driving axle is placed at the rear with the dead axle ahead, to provide increased traction to the driving wheels.

The new model has a gross rating of 28,000 pounds. Power is provided by an 80-horsepower, 6-cylinder engine with a 7-bearing crankshaft, the bearing diameter being 2¾ inches. It is built in three wheelbase lengths, 188-inch, 206-inch and 224-inch, listing at $3,895, $3,945 and $4,045 respectively. It has 20-inch by 7-inch ventilated disc wheels with 34-inch by 7-inch tires, duals on all four rear wheels.

As on other Federal six-wheel models, six-wheel hydraulic brakes are provided. These are 16x2¼ front and 17¼x4 inches rear, one on each wheel. They are power-operated by vacuum booster.

Rear end construction of this model is similar to other Federal six-wheelers. With this design, rear wheels are permitted to adjust themselves independently to road irregularities, to assure easy riding and protection to cargo.

All spring pins connected with the rear axles of this unit and all trunnion pins are mounted on Federal

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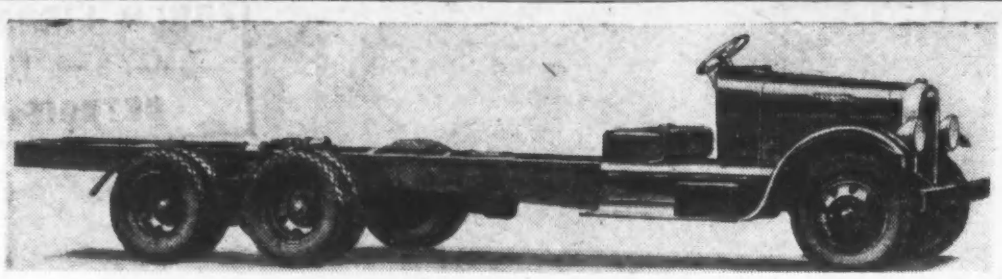

NEW FEDERAL 8-ton six wheeler model

FEDERAL 8-TON SIX-WHEELER IS PRICED AT $3,895

(Continued from Page 1)

patented Reservoil bearings, which are automatically lubricated.

Increased flexibility of the rear end is obtained by the use of swivel brackets for connecting the rear springs with the rear driving axle. These take the place of the ordinary spring seat, allowing each axle to move up and down freely in a direction at right angles with the chassis frame.

Swivel brackets also accomplish the function of preventing the twisting action of the springs from being transmitted from the road to the frame and its body members.

RUBBER IMPORT TAX PROPOSED IN SENATE

(Continued from Page 1)

was estimated, would yield $50,000,000.

Along the lines of the duties on oil, coal, copper and lumber, which already have been banned by the committee, the rubber tax, however, is viewed by the committee leaders as not ncessarily a protective duty, since little or no rubber is produced in this country.

Therefore, the Republicans contend, it is for revenue only.

On the other hand, while both the Senate Finance Committee and earlier the House Ways and Means Committee gave the automotive industry the fullest opportunity to offer arguments in opposition to the tax on motor vehicles and accessories, the rubber industry was expected today to demand an immediate hearing on the proposed rubber levy.

It was pointed out that the levy of 5 cents a pound on crude rubber would be borne by the tire manufacturers. Subsequently it would be passed onto the consumer, necessitating a sharp upward movement in retail prices.

At a time when the rubber manufacturers, in accord with the policy of the automotive industry, are striving to keep tire prices at their lowest levels in years, the proposed rubber tax, it was pointed out today, will precipitate widespread chaos all along the line.

The rubber manufacturers are expected to combat the proposed tax on the grounds that the levy is not necessary as a protective measure, while at the same time tires and tubes cannot be placed in the luxury category along with cosmetics, brewers' wort, grape juice, parimutuel race bet tickets and other items. The Rubber Manufacturers' Association refused today to make any statement regarding the proposed tax until all details of the proposal are available.

While the automotive industry holds out but slight hope of the proposed tax being knocked out of the bill, it is still possible that when the measure, as rewritten and completed by the finance committee, reaches the floor of the Senate it will be severely attacked by Senator James Couzens (Rep., Mich.) and several other members.

When the vote was taken in the committee on the automotive tax section, Senator Couzens made a motion to strike it out, but was defeated by a vote of 12 to 5.

It also is possible that if any appreciable amount of opposition develops in the Senate to the automotive tax, this section will be taken under advisement when the bill finally goes to conference between the Senate and House conferees.

DAHL AND KELLY NAMED DIRECTORS OF WHITE COMPANY

(Continued from Page 1)

tion, being a spokesman for the entire automotive industry in the National Automobile Chamber of Commerce.

George H. Kelly has been treasurer of the company for the last ten years, and two years ago was elevated to a vice-presidency. His affiliation with the company dates back to 1915 in connection with selling national accounts. He has a wide acquaintance in business and financial circles throughout the country.

MARCH CAR-TRUCK SALES TOP FEBRUARY

(Continued from Page 1)

New truck sales during March in forty-five states reached 16,262 units, according to the Polk Company. This is an incresae of 18.21 per cent. over February sales of 13,757 units in the same states, and a decrease of 44 per cent. under March, 1931, sales of 29,041 units in the same states.

Total truck sales are estimated at 17,141 units for March, as compared to 14,388 units in February, 1932, and 30,609 units in March a year ago.

BUYS AUTOMOBILE SUPPLY

Batavia, N. Y., May 2. — Frank Horton, Jr., has purchased the United States Auto Supply Company, 65 West Main St., in this city. John Barone will manage the supply house for the new owner, following extensive alterations and improvements. R. H. Colburn and Ralph Smith formerly were the owners.

FINANCIAL NEWS

COMMERCIAL CREDIT CO.

Baltimore, May 2.—Consolidated operations of Commercial Credit Company and subsidiaries for the first quarter (usually the poorest) ended March 31 showed net income of $700,515.39, which was at the annual rate of 90 cents per share on the outstanding common stock. This compares with net income of $865,752.55 for the first quarter of 1931, which was at the annual rate of $1.34 per share on the common stock. Interest and discount charges were earned 1.88 times for the first quarter of 1932, as compared with 1.96 for 1931. Dividends on the company's 6½ per cent. and 7 per cent. first preferred stocks were earned 3.58 times, and on the Class A $3 convertible stock 2.32 times for the first quarter of 1932, as compared with 4.02 and 2.78 times, respectively, for 1931. Dividends on all preferred, including the convertible A stock, were earned 1.52 times for the first quarter of 1932, as compared with 1.69 for 1931. During the first quarter of 1932 there was realization of $1,510,348.14 on the assets of Kemsley, Millbourn & Co., Ltd., in liquidation, with reduction in reserves of only $213,570.94, leaving unliquidated assets, excluding cash, on March 31 of $3,072,164.96, with reserves thereon $1,187,490.10, or nearly 40 per cent.

FOLLANSBEE BROS.

New York, May 2.—The Follansbee Brothers Company (makers of tin plate, steel sheet, etc.) reports for quarter ended March 31 net loss of $301,196 after depreciation, interest, etc., comparing with net loss of $203,956 in first quarter of 1931. Current assets as of March 31 last amounted to $3,157,477 and current liabiliteis $356,992, comparing with $4,435,379 and $452,064, respectively, on March 31, 1931.

CHICAGO PNEUMATIC TOOL

Chicago, May 2.—Chicago Pneumatic Tool Company and subsidiaries report for quarter ended March 31, 1932, net loss of $88,741 after depreciation, interest and amortization of discount on bonds. This compares with net profit in the first quarter of 1931 of $1,442 after depreciation, interest and taxes, equivalent to less than 1 cent a share on 187,600 shares of $3.50 preferred stock.

ELECTRIC AUTOLITE

Toledo, May 2.—Consolidated income account of Electric Auto-Lite Company and subsidiaries for the quarter ended March 31, 1932, follows: Gross profit from operations and other income, after provision for depreciation, $1,053,484; expenses and all other charges, including Federal taxes, $505,804; net profit, $547,680.

FIRESTONE TIRE AND RUBBER

Akron, May 2.—Firestone Tire and Rubber Company has declared the regular quarterly dividend of $1.50 on the Series A 6 per cent. cumulative preferred stock, payable June 1 to stock of record May 15.

WHITE COMPANY

Cleveland, O., May 2.—Directors of the White Motor Securities Company in meeting today declared the regular quarterly dividend of $1.75, payable June 30 to stock of record June 13.

KELSEY-HAYES WHEEL

New York, May 2.—Net loss of Kelsey-Hayes Wheel Corporation and subsidiaries for quarter ended March 31, 1932, was $656,533 after taxes, depreciation, interest, etc.

S. A. E. Outlines Program For June Summer Meeting

(Continued from Page 1)

which completely defies description.

WEDNESDAY, JUNE 15

Chassis

Brakes from the drum and lining points of view, as well as a discussion of free wheeling devices and control.

Bodies

Future design of automobiles and a discussion of the methods used in the production of bodies.

THURSDAY, JUNE 16

Streamlining

The "W y" of present day streamlining of passenger cars.

Diesel Engines

Analysis of ignition, qualities of Diesel fuels and other Diesel problems.

Aircraft

Something all air-minded folks will want to hear and see.

FRIDAY, JUNE 17

Research

Technical reports on society research projects covering riding comfort and fuels.

In addition to the technical program there will be the usual colorful golf tournament and other forms of entertainment.

SPARKS from DETROIT

Hupp Dresses for Sunday

* * *

Roy Peed Likes the Doughnuts

* * *

Eat Your Way to a Car

* * *

Spiking Price Rumors

* * *

Chris Sinsabaugh—Detroit Editor

IT has remained for Hupmobile to suggest Sunday clothes for the automobile. This is made possible, in the case of Hupmobile, through the offer as optional equipment of the Kelsey-Hayes detachable chromium-plated disc. An owner desiring to doll up the car for special occasions can attach the Kelsey-Hayes device in a jiffy over his wood or wire wheels and go on dress parade with shining discs.

These discs fit snugly over the standard wheel from felloe to felloe. They are of stout spring steel, and are attached in a few minutes by removing the wheel hub and slipping the disc over the flange.

* * *

ANOTHER BIT OF NEWS I picked up at the Hupmobile factory is that it has dispatched Russell Snowberger to Indianapolis with the car that is expected to bring home the bacon in the Memorial Day 500-mile race. Snowberger is the first of the near-stock car aspirants to set up his camp at the Hoosier oval.

* * *

ROY PEED, general sales manager of De Soto, gives us his reaction after driving 2,200 miles in one of his cars fitted with doughnut tires, which are now offered optionally.

"Running with only sixteen pounds of air pressure, the possibility of blowouts is almost negligible," says Peed. "Because they are larger and the tread contact with the road wider, they have a tendency to minimize skidding under all conditions.

"We took curves with safety at higher speeds, because the tires have a gripping action on the road, and never did the car have a tendency to veer from its course. It seems to me that the doughnuts are not nearly as subject to stone bruises or cuts as ordinary tires, and blowouts are minimized because of the low pressure. Gasoline consumption seems about the same as with balloons."

* * *

WE STILL RECALL the automobile wisecracking of Will Rogers when he was the guest speaker at the N. A. C. C. annual banquet, so next Sunday we are going to give the dials a twirl and tune in on the Chrysler Motors-Ziegfeld radio hour—10.30 (11 E. D. S. T.)—in hopes of getting more of the same stuff. It's Will's turn again that night.

* * *

FROM E. L. CORD'S SPEECH before the Illinois Manufacturers' Cost Association I pick out one interesting statement as to how the airplane is solving one of the service problems of the automobile dealer. The president of Auburn cited the case of the Packard dealer at Springfield, Ill., who takes advantage of the speed of airplane transportation.

Whenever this Springfield dealer finds he is shy a needed part, he calls St. Louis. The Packard people there fill the order, put the parts on the next ship out and an hour and a half later the Springfield man gets it.

This eliminates obsolescence of parts inventory, Cord said, and, consequently, offers a great deal more profit, making it possible to do business with a smaller inventory investment.

* * *

SO MANY HAVE STOPPED EATING out this way that one of the places where we grab a noon-time snack is offering an automobile as a trade stimulant. Every time you eat there you get a ticket giving you a chance at the car. Two months from now the winner will be picked.

* * *

IT HAS BEEN SERIOUSLY SUGGESTED by several executives with whom I have discussed prices that an effective way to make the public realize that there is no price-cutting war or that prices are likely to go lower would be for makers to advertise that present prices are not guaranteed for more than a month. Then the bargain hunters would realize that the time to buy is now; that prices are trending upward because production so far does not warrant the low prices quoted.

Retail Salesmen—This Is Your Page

This department is devoted to the interests of the retail sales division of the industry. Salesmen, this is your department. Automotive Daily News wants you to get something from this department that will help you in your work on the firing line. It wants you to pass on your own experiences, successes, failures to help your brother salesmen. Send in your story in the form of a letter, or even a postal card, and let us get it ready for publication. Your achievement or your mistake may help another salesman to make sales or avoid errors that cost you commissions.

Dealers read this page. Give us the benefit of your reactions on these problems that affect the work of your salesmen, the men on the firing line, the men who bring home the bacon or don't.

A BLIZZARD DIDN'T STOP THIS WILLYS-OVERLAND DEALER

On March 7, Binghamton, N. Y., and the surrounding country were visited by the worst blizzard in forty-four years!

For three days, telephone communication between Binghamton and Elmira was cut off—the first time in eighteen years and perhaps longer.

The storm was accompanied by a heavy snow.

Hardly an opportune time, you may think, for inaugurating a used car sale, but that's what Fred Schwenke, vice-president of the Southern Tier Motor Company, did—and with this amazing result:

Thirty-eight used cars sold between March 7 and 26, reducing dollar inventory of used car stock by approximately one-half!

During the first four days of the sale the going was difficult, but even so, eleven used cars were sold for a total of $2,301, of which a substantial proportion was cash.

"On the first and second days of the sale," writes Mr. Schwenke, "our salesmen were stuck in the snow and it was just one thing after another. However, it went over."

You will be interested to know that this sale was conducted without one penny of advertising expense.

And here is Schwenke talking and telling how he did it:

"We insisted that each salesman make at least twenty telephone calls a day, these being made at random from the telephone book and registration list. Also, they were to make twenty personal calls a day, which, of course, kept them quite busy. These personal calls were picked at random from the registration list as well as telephone book, and also all those we picked up on the telephone.

"This is in addition to their regular calls on prospects they had or leads they were able to develop outside of this procedure. It was a difficult job at first to force them into this telephone work, inasmuch as they were rebuked on a number of calls, as well as those who were out of work, no money, etc.

"However, the record of the sale speaks for itself, and it is partly due to the telephone conversations. As a matter of fact, we know of five direct sales made from the telephone calls on people whom we did not even know were interested in a car and did not have any way of contacting them other than the telephone. How many others, of course, it would be difficult to determine.

"As a matter of fact, 1,200 telephone calls were made in ten days, 1,200 personal calls were made in the ten days. Of course, you realize that in today's efforts of selling, it takes more suspects to make a prospect and more prospects to make a sale that it ever has before in the automobile business.

"We issued no written instructions to the salesmen, but had a meeting of thirty minutes each morning. While it could not be exactly considered a pep meeting, it was a meeting where we drilled home the necessity of the sale of the used car and the necessity of their constant solicitation.

"Another stunt we used which I believe is very good is that we insisted that each salesman pick out five used cars and he was to study them thoroughly, knowing all about them, specifications, tires, conditions, etc., so that they could intelligently discuss the car on the street with whomever they contacted. We found that this was a big help in the sale of the cars, inasmuch as the average salesman of today does not know the specifications of the used cars he is selling, which, many times, holds back the sale.

"The telephone conversation was as follows:

"'This is Mr. Palmer of the Overland-Willys-Knight Car Corporation, 227 Water St. We are making very low prices on the used cars we have in stock and believe that now is the time for you to trade your car in for another good used car. Incidentally, we would like to advise you that the new Willys-Overland Six is the lowest priced six-cylinder car in America.'

"We were told that the husband was not home, that they were not interested, that they had another car to trade, and all sorts of things; but, nevertheless, not a day went by but what each salesman obtained a prospect from these telephone calls, and, furthermore, these calls were made on people whom we have never contacted, and probably never would have, in any other manner. Of course, it meant a constant follow-up on these things and it was necessay for us to have a man stand over the salesmen and insist that the calls be made every day."

BRYAN IN NEW POST WITH OAKLAND MOTORS

Minneapolis, Minn., May 2.—W. J. Bryan, branch manager for the Oakland Motor Company in the Minneapolis and Northwest territory, has left to assume the management of the Oakland branch offices at Oklahoma City.

PITTSBUHGH LINCOLN DISTRIBUTOR MOVES

Pittsburgh, Pa., May 2. — The Linford Motor Company, Inc., Lincoln distributor, has removed its sales department into larger and more modern quarters at 3968 Forbes St.

NEW FORD DEALERSHIP

Birmingham, Ala., May 2 (UTPS).—The Mogford Motor Company, Ford dealer of Ensley, suburb of Birmingham, has been succeeded by Iron Motors, Inc., with Andrew T. Maxwell as president. The company is located at 2112 Avenue E, Ensley.

KY. TRUCK LAWS EFFECTIVE JUNE 18

(Continued from Page 1)

hearings will be held and permits issued, Mr. Claypool said.

In his communication to the operators of trucks and buses, Mr. Claypool said:

"Under the provisions of one act, trucks regardless of size, engaged in the transportation of property for hire, either as a common carrier or contract carrier, must make application for a permit and accompany such application with a fee of $25 by June 18, 1932, and arrange to file schedules of freight rates between different points.

"Trucks weighing under 5,500 pounds do not have to pay the mileage tax but come under all the other provisions of this act, including the securing of a certificate from the State Tax Commission and depoting insurance covering personal liability and property damage as well as cargo.

"Daily records should be kept by all persons, firms or corporations on all buses and also on trucks that weigh more than 5,500 pounds as to the points made and the miles run that day and after June 18, which is the day that the mileage tax goes into effect."

BAY STATE STARTING SPRING CAMPAIGN TO CHECK UP ON VEHICLES

Boston, Mass., May 2.—The spring campaign to check up those automobiles which have not yet had their equipment inspected started yesterday, the registrar of motor vehicles, Morgan T. Ryan, announced tonight. He has ordered his entire force of inspectors and examiners in all parts of the state to be on the road and on the alert to stop every car not displaying the official green sticker as evidence that its equipment has been duly inspected.

"Under the rules and regulations requiring this periodic checkup as to brakes, headlights, rear lights and other equipment, every car should be inspected and should display the green sticker within fifteen days after it is registered and operated on the highways. Car owners, therefore, who obtained their plates in January have had four months' time in which to have their cars inspected. For them, as well as for those who have taken their cars out in February, March or previous to April 15, there is now no excuse for not having complied with the regulations," said Ryan.

"All cars not carrying the green stickers, and all owners not able to show their registration paper with certificate of inspection attached will be reported on complaint cards. These cards, in the case of owners found operating uninspected motor vehicles, will result in immediate suspension of the license of such owners. In cases where the car is operated by a person other than the owner, the complaint card will result in a hearing to be given the owner relative to the revocation of his registration."

BEGIN USED CAR 'DICKER' LOW

In a recent bulletin of the National Automobile Dealers' Association, C. A. Vane calls attention to something that the retail salesman will always do well to bear in mind, even though the sales manager will play a heavy role in the final adjustment. Here is Mr. Vane's suggestion:

On a recent trip one of the NADA staff members was in the manager's office of a low-price car dealer. In came a salesman with the information that he had a prospect with a used car for which the prospect had paid approximately $4,200 a little over two years ago.

The gist of the manager's conversation was that it was evident they could not handle such a used car. The price other dealers were paying for such cars was, by far, more than the delivered price of their new car—even more than two of their cars sold for. However, the prospect was entitled to the courtesy of an expression as he had taken the time to come to the sales room. In order to be sure there would be no "dickering" the manager in question estimated that an appraisal of $100 would accomplish the desired results and prevent any further arguments. To be doubly sure he gave the salesman a price of $90 and dismissed the subject from his mind.

In a matter of a few minutes the salesman returned with the order written up and signed. Proper credit references given and the prospect ready for delivery of the new car.

This used car was put in stock after being cleaned and sold in forty-eight hours for a gross profit of appoximately $25.

Naturally, this is an extreme case. But does illustrate a very important point. If it is a case of bidding and "dickering" with the prospect, the dealer is much better off by starting at a point almost ridiculously low. You can always go up. But when starting too high you are lost from the start.

Another suggestion. Why not find out from the prospect what he expects for his used car before quoting any price. If he is too far out of line he can be advised that such a price is impossible, and surely he does not want his time taken up by any salesman when there is so much difference in his demand and your maximum possibility of trade-in price. At least you can find if the prospect has any idea of weakening, for if he has he will try to find what your best price is, and when he does that it is certain he never intended to be able to get the price he first asked. Any prospect who demands that you quote him a price that will insure you of a net loss on the next four or five new cars you sell cannot expect much of your organization's time. He may be willing to argue indefinitely for every cent he forces you to raise an appraisal is net profit to him. To you it is simply a small reduction of an excessive loss.

Many dealers are prone to make themselves believe they have been working hard and been mighty busy after a lengthy discussion with a prospect of that kind. The real fact of the matter is that it is simply time wasted. There never was a chance to accomplish anything for your organization except a heavy loss, regardless of the time taken.

Another distinct advantage of refraining from quoting a price on a used car trade-in is that as long as the prospect is too much out of line you don't care what he buys. Further, let some other dealer do the preliminary battling on price. If the prospect is a "trader," he will be back to see what your price really is. If he is not that kind you have rid the sales department of one big liability.

BONEY SELLS DEALERSHIP AT ANAHEIM, CAL.

Anaheim, Cal., May 2. — Robert Boney has sold his Hudson-Essex dealership at 322 West Center St. to A. B. Miner. Boney will remain as manager of the Anaheim store. Miner was Hudson-Essex dealer at Fullerton, Cal.

REO NEW DEALERS

New Athens, Ill., May 2.—Kaiser & Stooky Motor Company is to sell and service Reo passenger cars and Reo speed wagons and trucks here. Johnson Brothers Motor Company of Staunton, Ill., has also taken the Reo franchise, Moulton's Garage, White Hall, Ill.

REO NAMES NEW OUTLETS

Mattoon, Ill., May 2. — Scott'e Garage has taken the Reo passenger car and speed wagon franchise for this city and surrounding territory. The Reo-Duluth Company is to handle Reo products in Pine River, Minn. Reo speed wagons are to be sold and serviced by the J. E. Kelley Garage, Mankato, Minn.

WORCESTER CAR DEALERS HEAR GOODWIN, BAKER AT ANNUAL MEETING

Worcester, Mass., May 2.—Frank A. Goodwin, president of the Automobile Owners' League, Inc., and chairman of the Boston Finance Commission, addressed the annual meeting of the Worcester Automobile Dealers' Association in the Bancroft Hotel. Mr. Goodwin was accompanied to Worcester by Chester I. Campbell, secretary of the Boston Automobile Dealers' Association and member of the governor's council, and Day Baker, secretary of the Massachusetts Truck Club.

Mr. Goodwin, long known as a fiery advocate of the rights of the motorist, explained to the members of the association and its guests the reasons for forming the Automobile Owners' League, described as a "non-porfit non-partisan" organization, and of what the league hopes to accomplish in the way of legislation.

The purpose of the league is "to protect motor vehicle owners against ill-advised legislation affecting insurance, registration, taxation of the operation of motor vehicles, and to foster such laws as may increase and improve highways, or may result in pleasurable and safe operation of automobiles."

This meeting is one of many that will be held throughout the state to arouse motorists to the imminent danger of further unjust taxation and to point out to them the necessity of being organized.

The board of governors of the league includes three Worcester automobile dealers, Ralph B. Jacobs, manager of the Hudson-Essex Company; Chester M. Stanley, treasurer of Worcester Buick Company, and Harold L. Gulick, secretary and treasurer of the City Truck Company.

Chevrolet Prosperity Caravan

A PROSPERITY CARAVAN bearing the message "Let's Go America" is touring the metropolitan New York section this week in an effort to stimulate public interest in automobiles and trucks. A feature of the caravan is a huge chart carried on one truck which lists the materials used by automobile manufacturers in the production of automobiles. The purpose of this chart is to bring home to the public the stimulating effect of automotive purchases on the business of the country as a whole

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English Engineering Opinion

IN recent issues of the British motoring magazine, The Autocar, there has been running an interesting series of opinions of well-known English engineers of what the car of ten years hence will embody. In the current issue of this magazine Frank Woollard of Morris, Gayne Knowles of Hotchkiss and A. T. Barrow of Rover all give their ideas of the car of 1942.

All these gentlemen are pretty well agreed that the motor car of ten years from now will have an engine placed at the rear, because of the obvious contribution to streamlining that this location can be made to yield. Mr. Woollard says: "The rear engine position is, I believe, a more logical and more likely development than front wheel drive; but even if the engine takes a back seat, it is more than possible it will still remain within the wheel base."

Mr. Knowles of Hotchkiss is a little more conservative in his opinion, contenting himself with saying that: "No doubt experiments will be made as to the ideal position of the engine in the chassis frame."

Mr. Barrow of Rover says: "The motor car of today is really made very inefficient because of its body design. It is rather peculiar that we should accept the streamlining of aeroplanes and submarines and yet object to the streamlining of motor cars. Nature has streamlined fish and fowl for efficiency's sake; sooner or later the motor car must follow along these lines. In order to facilitate streamlining the engine will ultimately be located in the rear of the car."

These gentlemen have some other interesting ideas on the future development of power plants for motor vehicle service. Mr. Woollard foresees for 1942 "the power unit as an internal combustion engine running on spirit, with a combination system modified by Diesel influences. Overhead valves, operated by overhead cam shafts will, I believe, be in the majority."

Mr. Barrow believes that "the car in ten years' time will have its brakes, gear change and steering operated by power from the engine. In the meantime, I believe development will be along the lines of free wheeling, self-jacking and complete self-lubrication. There is every possibility, too, that an internal combustion turbine engine will be largely used ten years from now."

Mr. Barrow has ventured somewhat further along than ten years, to predict the eventual arrival of what he calls the "radio car." He then explains:

"What I mean by radio car is a road machine deriving its electric power from the air to rotate its electric motors and thus propel it and its passengers in silence along the roads of the world.

"Today we have huge broadcasting stations sending out tiny electric currents, to be picked up by radio valves and intensified sufficiently to operate loud speakers. It does not require a very great stretch of the imagination to visualize a radio motor car operating on similar lines. I believe such a motor car will have affixed to it an electric recording meter which will register the amount of current consumed and payment for this current will be made to the government or whoever happens to own the electric power broadcasting stations.

"Such a car, I believe, will have its brakes and steering gear operated electrically. Development along these lines will of necessity be slow, because the motor car industry at the present time has not and in all probability for a year or two will not have, sufficient money to invest very extensively in such advanced experimental work."

A very interesting glimpse of what the engineering fraternity in England is thinking about.

Trade Association News

Standard Appraisal Form Considered by Washington Dealers' Association

The Washington, D. C., Automotive Trade Association is considering the adoption of a uniform standard appraisal form and the following bulletin has been sent out to members:

At the regular April meeting held at the Racquet Club, it was unanimously voted that the subject matter be considered for adoption for the use of the members of the association and the manager should compile and submit to the members for their approval or criticism a tentative standard appraisal form and at the time of submission to outline the procedure of its use.

In order that you may be fully familiar as to how the form is to be used we give you the following:

If the member decides to approve the form and use it, supplies of such forms can be obtained through the association's office in sets of two, consisting of original and duplicate, and in sets of three, consisting of original, duplicate and triplicate, with member's firm name imprinted on all copies. In making up the form, insert the year and the model number of the new automobile on which the particular appraisal is to be applied. The reason for this is, when clean-up time arrives or at a time when a dealer has two new different year models on hand or when he has a high-priced model or a slow-moving body type on which he has some sort of an inside price, this will appear on the appraisal sheet. It is recommended that the expiration date be limited to five days.

The idea of numbering the appraisal in the event a member wants to talk to a fellow member about it, all that he will have to do is to mention the number of it.

In compiling this appraisal form, efforts have been put forth to include every item and to place these items in the usual order that an appraisal is made; namely, starting at the tires and in the regular way going to the top, etc. You will notice that two columns are provided, one to show the amount of parts in dollars that will be needed and the other to show the amount of labor in dollars that will have to put on the vehicle in question. A space has been provided to put in the Blue Book price and the Washington advertised used car price. The last named can be obtained from the monthly used car price report that we send you. If you do not desire to place this on the customer's copy, the appraiser can place it on his copy, which information will be of value to the sales manager in the event that the appraisal finally reaches him for a decision.

The only criticism that we have had to this appraisal form up to now is that there is too much on it, but in this connection let us say that a number of dealers in making an appraisal go into all of the detail that is shown on this form. While it is true that a number of the dealers do not; in order to take care of this situation we have taken the "highlights" such as tires, fenders, etc., and put them in CAPS and therefore the dealer who does not want to go into detail is able to use this form that is submitted, where if the form was simpler it could not be used by the dealer who desired to go into details.

After the appraisal is made, whether in duplicate or in triplicate, a carbon copy (for the reason that carbon copies are hard to change) is to be given to the prospective purchaser. Now for illustration, let us say that the first appraisal made was $400. The prospective purchaser running true to form wants $500 and in order to get it goes and calls on another dealer and asks for an appraisal. This dealer makes an appraisal in the same amount, namely, $400 but the prospective purchaser tells the second dealer that the Smith Automobile Company has just given him $500. The second dealer says, I am afraid that the Smith folks have made a mistake in some way or another, perhaps in the year, sale price or conditioning cost and therefore would you be good enough to let me see the copy of the appraisal sheet that they gave you when your car was appraised. The prospective purchaser refuses and moves on to another dealer when the same story as outlined above is repeated. When he is asked the second time to show the appraisal sheet for $500 he then realizes that he is trapped and that he had betetr stop lying, and perhaps then the thought will come to his mind that at last the automobile dealers have taken steps to prevent the prospective purchaser from playing one dealer against the other and therefore there is no need for him to do any further shopping in an endeavor to get a higher appraisal but to buy the automobile that he prefers from the dealer that he feels will give him the best car or the best service.

Please do not misunderstand. There is no thought that this particular appraisal form is going to cure at one swoop the used-car evil as it exists at this time, but it is believed that the use of this form will be a start in the right direction if the motor vehicle dealer members of the Washington Automotive Trade Association adopt it, and, above all, use it in the way it is intended to be used. At least it can't hurt, and it is felt that it will materially help this terrible situation which confronts the automobile dealer at this time.

Here are the prices of the form:

In duplicate. Original white bond paper, duplicate pink bond paper, twenty-five sets to a pad (fifty sheets), name line only change to be made:

1,000 sets	$7.00
500 sets	5.00

In triplicate. Original white bond paper, duplicate pink bond paper, triplicate canary bond paper, twenty-five sets (seventy-five sheets) to a pad, name line only change to be made:

1,000 sets	$8.00
500 sets	6.00

If there are any more questions that you would like to ask about the use of this form or further explanations concerning the use of it, telephone the writer and he will be glad to give you the information that you seek.

The adoption of this form as a standard one of the association and the use of it will be acted upon at the regular May meeting of the members.

DE SOTO DISTRIBUTORSHIP TO LORD CALVERT MOTORS

Baltimore, Md., May 2. — Lord Calvert Motors, Inc., of which John R. Cochrane, sales manager of the former distributor, is president, has been named De Soto-Plymouth dealer at 2034 Frederick Ave.

AWARDS FOR ARCHITECTS

Jersey City, N. J., May 2.—Ely Jacques Kahn, chairman of the jury of the Architects' Emergency Committee for Unemployed Architects and Draftsmen, yesterday announced Arthur Martini of 3254 Hudson Boulevard, Jersey City, was awarded the first prize of $100 for his design of roadside filling stations. Second prize, $75, to John J. Burton, 51 Bayley Ave., Yonkers, N. Y.; third prize, $50, to W. J. Ward, Jr., 75 Sylvan St., Rutherford, N. J.

NEW BUILDING OPENED

Hartford, Conn., May 2.—Jensen Auto Service, Inc., has opened its new $15,000 sales and service building at 74 Park Road, West Hartford. The concern, which is headed by Kristian Jensen, has taken a Plymouth and Dodge franchise.

SELLS DEALERSHIP

Fresno, Cal., May 2.—T. P. Shelton, Hudson-Essex dealer, formerly Hudson-Essex distributor for seven counties, has sold his dealership to Lloyd Anderson, an associate in the dealership.

REFINERY STATISTICS

New York, May 2.—Reports compiled by the American Petroleum Institute for the week ended April 23, from companies aggregating 3,661,600 barrels, or 95.1 per cent. of the 3,852,000 barrels estimated daily potential refining capacity of the United States, indicate that 2,257,600 barrels of crude oil were run to stills daily, and that these same companies had in storage at refineries at the end of the week, 47,285,000 barrels of gasoline, and 124,326,000 barrels of gas and fuel oil.

Reports received on the production of gasoline by the cracking process indicate that companies owning 95.6 per cent. of the potential charging capacity of all cracking units manufactured 3,076,000 barrels of cracked gasoline during the week.

All figures follow exactly the present Bureau of Mines' definitions. Crude oil runs to stills include both foreign and domestic crude. In California, stocks of heavy crude and all grades of fuel oil are included under the heading "Gas and Fuel Oil Stocks."

BUYS FORD DEALERSHIP

New Anbany, Miss., May 2.—J. B. Shannon has purchased the interest of H. M. Pitner in the Ford agency here.

COMING EVENTS

MAY

1- 8—**Penzan, Poland.** International Fair.
2- 6—**Philadelphia, Pa.** American Society of Mechanical Engineers management division meeting.
4- 6—**Honolulu, Hawaii.** National Foreign Trade Council.
4- 7—**Dublin, Ireland.** Commercial Car Show.
7-11—**Cleveland, O.** American Society for Testing Materials, meeting.
7-16—**Budapest, Hungary.** International Fair.
12-13—**Cleveland, O.** American Gear Manufacturers' Association, meeting.
14-15—**Atlantic City, N. J.** Annual convention New Jersey Automotive Trade Association. Hotel Jefferson.
16-20—**San Francisco, Cal.** United States Chamber of Commerce, annual meeting.
19-20—**Chicago, Ill.** National Battery Manufacturers Association meeting. Hotel Sherman.
23-28—**Chicago, Ill.** Radio Manufacturers Association, meeting. Hotel Sherman.

JUNE

Bordeaux, France. Automobile Show.
Cork, Ireland, Commercial Car Show.
Paris, France.—International Automobile Manufacturers Association sixth annual Motor Transport Congress.
1- 3—**Tulsa, Okla.** American Petroleum Institute, mid-year meeting, Mayo Hotel.
8-11—**State College, Pa.** American Society of Mechanical Engineers, National Oil and Gas Meeting.
12-17—**White Sulphur Springs, W. Va.** Society of Automotive Engineers, summer meeting.
20-24—**Atlantic City, N. J.** American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall.

JULY

3—**France.** Grand Prix Automobile Race.
5- 9—**Southampton, England.** Commercial Car Show.
9-10—**Belgium.** Grand Prix Automobile Race.
17—**Germany.** Grand Prix Automobile Race.
20-22—**Llandrindod, Wales.** Commercial Car Show.

OCTOBER

3- 7—**Washington, D. C.** National Safety Council, meeting.
3- 7—**Buffalo, N. Y.** National Metal Exposition, 174th Regiment Armory. W. H. Eisenman, 7016 Euclid Ave., Cleveland, director.
3- 7—**Buffalo, N. Y.** National Metal Congress. Sponsored by American Society for Steel Treating, with cooperation of American Society of Mechanical Engineers, Institute of Metals and Iron and Steel Divisions of American Institute of Mining and Metallurgical Engineers, American Welding Society, Wire Association.
13-22—**London, England.** Olympia Show.

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Production--Engineering--Factory

HOW MUCH POWER CAN AN ENGINE PRODUCE?

This is the second installment of a paper by Earl Bartholomew, director Electrical Laboratory, and Homer H. Dido, Ethyl Gasoline Corporation, read before the Chicago section, S. A. E.

Supercharging, then, even though not utilized in connection with the automobile engine at present, may be a solution in part for further increases in power demands of the not distant future.

Increased Engine Efficiency

The answer to the question suggested by the title of this paper is now revealed in Fig. 3. Maximum theoretical brake mean effective pressures for the unsupercharged Otto cycle are shown for a range of compression ratios. Also the brake mean effective pressures of several American engines are shown which gives a comparison of the theoretical and actual brake mean effective pressures. The principal factors responsible for the variation in power developed by the commercial engines are valve timing and opening and degree of effective cooling. The airplane motor develops high specific power principally because it has good cooling and high volumetric efficiency. The improvements in the power of the single cylinder test engine were effected by cooling, while the commercial car was improved in horse power by increasing the compression ratio; an increase in compression ratio from 5 to 1 to 6 to 1 netted 9 per cent. increase in power. This fact, coupled with extensive experimental work and commercial practices, proves that similar increase in motor power can be made in other engines through increased compression.

Valve timing and opening, then, influenced volumetric efficiency. High volumetric efficiency is essential to insure high specific developed power. Power falls off more rapidly than volumetric efficiency as the latter is reduced.

Efficient cooling greatly increases power and lowers specific fuel consumption without engine redesign or adjustment. Fig. 4 shows the effect of cooling on brake mean effective pressure, volumetric efficiency, and fuel consumption over a range of air fuel ratios. Fig. 5 shows the effect of cooling a single cylinder engine with air under normal cooling and

(Continued on Page 11)

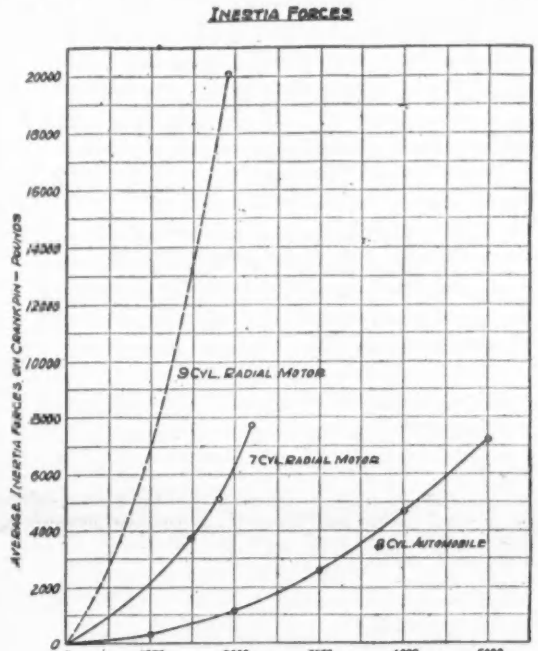


FIG. 1

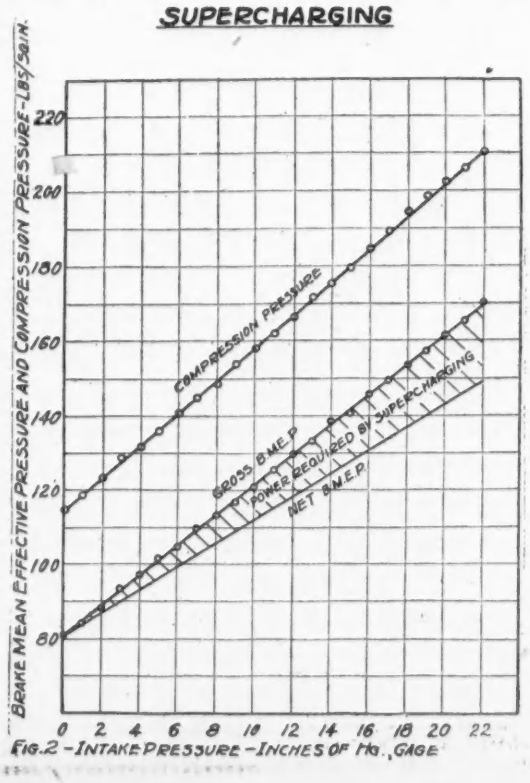


FIG. 2

CON-ROD BORING MACHINE

The Schumaker Automotive Equipment Company, Freeport, Ill., is bringing out a new Con-Rod boring machine, known as the model SB.

The specifications of this new boring machine are as follows:

Boring capacity, 1¼ to 4. Longest rod, 18½ inches, center to center.

Power drive, power feed.

A ¼ horsepower motor used.

Tail block; will handle all sizes of rods from ⅝ to 1½ inches, wrist pins, expanding bushing, eliminates time of looking for piston pins of the right size.

Rod holding device; this device holds the rods firmly while boring with the use of extension nuts which are furnished with machine.

Spindle sleeve; this sleeve was made extra large in diameter. It is ground to fit, insuring straight bearings as well as of uniform diameter. Equipped with thrust bearing r. p. m. 400.

Centering device (3 point); expanding device which slips over end of boring spindle, thereby centers rod accurately.

Equipment furnished with machine consists of 2 centering devices, 1 set boring and facing tools, 1 pair each ⅜ inch, 7-16 inch and ½ inch extension nuts, 1 extension nut wrench, 1 extension plug for boring Ford rods.

Net weight, 250 pounds; crated, 275 pounds.

DETACHABLE ARM RESTS

The Standard Arm Rest Company, Providence, R. I., manufactures a detachable arm rest which is upholstered in whipcord, plush or mohair. The rest is adjustable and can be made to fit all cars. It hooks over the sill inside the glass, so that the latter may be raised or lowered while the arm rest is in place.

The standard model upholstered in whipcord or plush lists at $5 a pair and the de luxe model in mohair is priced at $7.50 per pair.

Artistic Vs. Scientific Streamlining

By COUNT A. de SAKHNOFFSKY

Right now, when streamlining has become a common topic of conversation in every reunion of automobile engineers and designers, it is desirable to view this interesting subject from different angles.

There are two kinds of streamlining, the artistic streamlining and the scientific one, and here is the explanation of what I mean by artistic streamlining. Let us admit first—and I believe that every one with a well developed taste will agree—that perfect scientific streamlining is ugly. Clumsy is the best word describing most of the essays in that direction, both in Europe and here. I do not, of course, include single-passenger racing cars like Capt. Campbell's Blue Bird, as I am thinking of production problems and possibilities, and not freak cars built for a single purpose.

When a British authority on rear-engined cars was asked (during a conference here on streamlining) whether his car could be designed to have at least some eye appeal to add to its mechanical advantages, he evaded a direct answer by the following statement: "Any educated man finds beautiful a thing which is theoretically correct and built for a certain purpose." But—he forgot that most of us men have, in addition to education, a certain artistic taste—and then there are women.

Just imagine a salesman thoroughly selling his prospect on the perfect streamlining and its advantages of some 1933 cars, and the poor fellow driving it home to show it to his wife. The first thing he will hear at home will be: "Maybe it is wonderful for wind resistance, but it looks like the deuce." As for women, who constitute or influence certainly more than half of the sales, it is eye appeal which creates the desire of possession, which, after all, is what makes the industry move. And we all know that an object must sell itself, as it is always a handicap to sell something which needs a lot of apologetic explaining. But for a certain time designers have been using tricks which emphasize the impression of speed and power, though not having any practical bearing whatever on the performance of the car. And this is my definition of artistic streamlining: "Addition by a study of lines and proportions of an impression of speed and power, without the help of wind tunnel or dynamometer." And here is an example: High radiators with straight hoods give an impression of power and speed, though any engineer will tell you that a low radiator, bulging bonnet and high cowl reduce considerably the wind resistance.

Large diameter head lamps add a lot to the wind resistance, but, on account of looks, have been steadily increasing in size.

The last and very characteristic feature is the concave back, which is beautiful and typical for 1932 designs, but is just the reverse of what streamlining requires—i. e., convex shapes. Therefore, I believe one can make the statement that streamlining in its pure scientific form, if applied to the present-day automobile, would make it unsalable, and the belief that the buying public could be converted overnight to streamlined shapes (so contrary to the present lines) is a pure folly.

Far be from me the idea of denying the advantages of streamlining, its economy, better comfort, etc., and, as a speed enthusiast, I personally would make allowances for looks in so far as performance is improved. But it is exclusively an artist's problem to create a new eye appeal in the clumsy shapes formed by the wind tunnel. All this is particularly true for rear-engined cars, in which I have been interested for quite a few years, and is the result of a lot of disappointment in watching the freakish lines obtained thus far by the pioneers in that direction.

Let us give the public what it shows a preference for (grace and beauty), the way they understand it, and not try to put over something different, even if it is "theoretically correct."

Ferro Alloys in the Steel Foundry

By R. C. GOOD,

Metallurgical Engineer, Electro-Metallurgical Company, New York and Pittsburgh, in an article appearing in the current Steel Founder, organ of the Steel Founders' Society.

The use of ferro alloys in the steel foundry has become very common in the last ten years. Probably every melter is intimately familar with the characteristics and effect of the more common elements and has some idea of the changes effected by others which have been restricted in use by their high cost. Forty years ago this state of affairs was different; knowledge of the various alloys and their merits was limited to a few steel companies, principally those operating crucible furnaces. Usually, the superintendent of the melting department treated each heat by introducing a batch of "medicine" just before pouring, and looked askance at all intruders, whether they were metallurgists or helpers. Melting, in those days, was less scientific and considered an art. Years of back-breaking work and perseverance were necessary before a heat of steel was placed in your hands. Of the many explanations given to account for this "about face" in attitude wherein the public is now invited to examine most of the accumulated engineering data concerning the effect of alloys, the writer chooses to stress the demands by industry for general improvement in every field as the principal cause.

With more attention to detail in machine design in order to improve its efficiency, steels were required that possessed a higher merit index. Steel producers themselves investigated the strains and stresses to which their product was subjected. New compositions were submitted that either proved successful or failed, depending on their ability and ingenuity in diagnosing the problems. Meanwhile, growing groups of intelligeent men embarked on a systematic study of individual elements and their influence in all practical proportions. To these men we owe a debt of gratitude, as we now are in a position to, partically at least, correlate physical properties with chemical analysis and heat treatment, and the steel producer is able to proceed with considerably more confidence.

Our appreciation of the work in steel metallurgy by former students and writers cannot compare with that which is expected of those who follow. It is reasonable to look upon the first quarter of this century as a pioneering age. We have already learned of the architectural beauty of stainless steel, of the electrical properties of silicon steels, the toughness of manganese steel, the hardness of low chromium alloy steels and the resistance of oxidation at high temperatures of the high chromium steels, but have we always used good judgment in the application of these steels, or have we just aimed at a composition made by one of our competitors? Through a careful study of the effects of each alloy, it is hoped that further improvements and new ideas will be developed.

It has been claimed many times that physical properties of a definite magnitude can be obtained by incorporating exact amounts of manganese, silicon, chromium, nickel or some other special alloy, but the writer feels we should not overlook one important condition in regard to the relation between composition and physical properties that ordinarily escapes attention. Whenever the alloy added is of such a nature that it combines with or affects carbon or oxygen in addition to the iron, the results, as measured statically, will vary from heat to heat even though exceptional standardized methods are followed in its production. It is further contended that the effects of an alloy addition will be, in most cases, proportional to its distribution between iron, oxygen and carbon in the final steel and an exceptional ability is necessary in the melting shop to control this distribution. For instance, suppose 1 per cent. chromium is desired to impart sensitivity to heat treatment, or 1 per cent. silicon to improve electrical properties, it makes a profound difference whether this chromium or silicon is combined with carbon, iron or oxygen. Nickel is often used in the iron foundry to prevent chilled corners of castings; the amount necessary varies within rather wide ranges and is determined principally by the total carbon and silicon present (factors which are controllable), yet the nickel itself does not vary in quality. If, for a given effect in cast iron, the amount of nickel must be varied (an element that does not ordinarily unite with oxygen), how much more so must an element be controlled that readily combines with oxygen as well as iron and carbon?

Of all the ferro alloys, ferromanganese and ferrosilicon are the most common and most widely used. Their effects were investigated

(Continued on Page 9)

UP

Automotive Da

Revenue Fi

The Record

	Lines of Advertising Published First Four Months, 1932
** Automotive Industries (weekly) - - - - -	263,865
*** Automotive Daily News (daily) - - - - -	244,235
* Motor (monthly) - - - - - - - - - - -	239,806
** Automobile Topics (weekly) - - - - - - -	165,436
** Automobile Trade Journal (monthly) - -	152,460
** Commercial Car Journal (monthly) - - -	121,520
** S. A. E. Journal (monthly) - - - - - - -	91,753

*7 x 10 page except January issue 8¼ x 12 — 693 lines

** 7 x 10 page — 490 lines

*** Automotive Daily News page — 1,000 lines

Automotive Daily News
H. A. TARANTOUS, *Bus. Mgr.*, 350 HUDSON STREET, N. Y. C.
DETROIT OFFICE: Geo. M. Slocum, Manager
Fisher Building, Detroit, Mich.
WESTERN OFFICE: Willard R. Cotton, Manager
333 No. Michigan Ave., Chicago, Ill.

ve Daily News Registers a Gain in Lineage and

First Four Months 1932 Over Same Period 1931

Why?

High Reader Interest The editorial service of any publication determines the degree of reader interest. The subscription price is an index of the value the subscriber places on that editorial service. Automotive Daily News sells for $12 per year, not only the highest In the automotive industry, but four to twelve times higher than other publications. It is acknowledged to be the leading news medium in the automotive field and has a higher reader Interest than any similar publication.

Repetition Advertisers should use the insertion-frequency demanded by their merchandising problems. Repetition of sales argument is one of the most desirable methods yet found to make sales quickly, to create an impression and to continue that impression. In Automotive Daily News you have 260 issues per year—five times more opportunities than a weekly publication—over twenty times more opportunities than a monthly publication. You have the privilege of directing your sales message to the trade whenever you want it and with any frequency you want to, depending on *your* needs.

Large Size Page The tabloid size possesses many advantages, not only from the standpoint of sales message display but economy as well. A publication of comparatively few tabloid pages is easy to handle, quick and easy to read. Thus the busy executive who buys the paper is able to read the news during the business day. Bulk in a news medium is not attractive to a big executive whose every minute is valuable to him.

Visibility Even though a publication possesses all other advantages, if it is not easy for a reader to see advertisements, money is wasted. In Automotive Daily News there are no buried ads—all copy is visible—regardless of size, all advertising copy is adjacent to news—the very thing for which the reader buys the paper.

Multiple Readership Subscribers themselves pass their copies on to an average of over six persons. In dealer establishments where the dealer himself is a subscriber his salesmen want to read it. In some factories as many as twenty persons may read one copy. Thus the influence the paper exerts is far greater than the numerical quantity of its subscribers would indicate. Just another reason why results are obtained economically. The paper is read by factory executives of all kinds—dealers, distributors and their salesmen, leading jobbers, etc.

Economy Advertising here gets attention value regardless of the size of the ad, hence the advertiser can get greater frequency in Automotive Daily News, on a given expenditure of money. Because of many bonus distribution issues throughout the year, advertisers get in addition to our regular subscribers over 500,000 added distribution among truck fleet owners, bus operators and other groups who buy vehicles, parts, shop equipment, factory equipment, accessories. Added distribution may be had at no added cost. There are no wasted advertising dollars when you use Automotive Daily News.

Results No advertising is worth a great deal unless the advertiser gets results—orders for his product, new dealers and distributors or whatever else he is after. Unless a publication possesses certain desirable qualities apart from numerical circulation, results will not be forthcoming in proportion to the amount of money spent. On this page are outlined the specific advantages possessed by Automotive Daily News which have brought results to advertisers for many years and which will continue to do so in this publication or any publication with the same advantages.

MAKERS OF CARS CHIEF SUSTAINING STEEL INFLUENCE

(Continued from Page 1)

production last week and represents a gain of 9 per cent. over the operating rate at the low point of the year.

Valley trade authorities report that 27 to 83 open hearth furnaces in the district are melting, against 29 open hearths last week, indicating a momentary downturn in demands for steel for finishing mills. The number of open hearths active provides the best index to steel plant operations and less directly to activity in automotive plants taking steel from the Youngstown district producers.

Sheet and strip plant schedules here for the most part were indefinite at the week's opening, although several are likely to resume within the next few days.

Carnegie Steel Company plants in the district, with important customers buying more automobile shapes, is maintaining its schedule in Mahoning Valley plants at 33 per cent. of capacity, somewhat higher than the average for the independents. Mill schedules show that six of fifteen open hearths probably will be melting steel, largely for automobile consumers, during this week. The same company is operating its plants at Farrell, Pa., at almost half of capacity, due to activity of nearby rolling mills making tin plate.

Youngstown Sheet & Tube Co. sheet plants here are idle now but probably will resume shortly. Schedules for the plant were rather indefinite, although at least one has been resuming recently during the last half of each week. Sheet & Tube operations in the district are said to be at 16 to 17 per cent. of capacity, against 33 per cent. at this period a year ago. Weakness in demands for pipe accounts for disparity between the company's operating figures and the district average.

Republic Steel Corp. has shipped a large tonnage of iron ore to its Massillon-Canton division, where much automobile steel is manufactured. Higher melting operations at this division's plants apparently are indicated. Republic's Youngstown mills are slightly less active this week. Sharon Steel Hoop Co. is operating its strip plants at 30 to 35 per cent. of capacity, but has suspended its sheet mill pending alterations. Ingot production continues at 33 to 35 per cent. of capacity for this consumer.

READING R. R. BUYS FIRST RUBBER-TIRED STAINLESS STEEL CAR

(Continued from Page 1)

regular intervals and on tests since early this year. This type of rail vehicle, made entirely of stainless steel and fabricated by the Budd method of shot welding, makes possible extremely light weight and provides a permanency of construction not otherwise possible. This light weight permits it to be operated at from one-half to one-third the cost of existing rail vehicles. The pneumatic tires, plus the light weight, provide new standards of riding comfort on rail vehicles and we are convinced that this initial trial of a light-weight, pneumatic-tired car marks the inauguration of a new era in American rail transportation."

MORGAN-ROSE CHEVROLET IN LOS ANGELES MOVES

Los Angeles, May 2. — Morgan-Rose, Inc., for four years Chevrolet dealers at 5500 Pasadena Ave., has moved their headquarters to 8th and Alvarado, closer to the downtown business district. Fred W. Ryan, for the past six years sales manager for the J. V. Baldwin Company, Chevrolet dealer, has been appointed sales manager of Borgan-Rose, Inc., coincident with the change of location.

NAME LINCOLN DEALER

Birmingham, Ala., May 2 (UTPS).—The Lincoln Motor Company announced recently the appointment of the Duncan Motor Company as dealer here. The company is located at 2105 4th Ave., South.

MAJOR SPECIFICATIONS AND MECHANICAL DETAILS

Make and Model	Weight—5-P. Sedan	Wheel Base	Engine Make	Thermostat Used	Valve Arrangement	Cylinders	Bore and Stroke	Piston Disp.	Compression Ratio	Tax H. P.	Brake, H.P. and Peak R. P. M.	Pist. Make or Material	No. Main Br.	Oil Purifier	Fuel Cleaner	Carburetor	Air Cleaner
Auburn 8-100	—	127-136	Lyc	Dole	L	8	3 x4¾	268.6	2.56	28.8	98@3400	*Alum	5	Pur	No	Str	No
Auburn 12-160	—	133	Lyc	Dole	O	12	3⅛x4¼	391.0	5.50	46.8	160@3400	*Alum	4	Pur	Ste	Str	—
Austin	§1130	75	Own	—	L	4	2.2x3	45.6	5.10	7.8	13@3000	Alum	2	—	—	Til	No
Buick 32-50	3450	114	Own	Bish-Bab	O	8	2⅛x4¼	230.4	4.65	27.61	78@3200	CI	5	AC	AC	Mar	AC
Buick 32-60	3980	118	Own	Bish-Bab	O	8	3⅛x4⅝	272.6	4.63	30 02	90@3000	CI	5	AC	AC	Mar	AC
Buick 32-80	4450	126	Own	Bish-Bab	O	8	3⅝x5	344.8	4.40	35.12	104@2900	CI	5	AC	AC	Mar	AC
Buick 32-90	4565	134	Own	Bish-Bab	O	8	3⅝x5	344.8	4.40	35.12	104@2900	CI	5	AC	AC	Mar	AC
Cadillac 355 B	—	134-140	Own	Har	L	8	3⅜x4⅛	353.0	5.38	36.4	115@3000	CI	3	AC	AC	Own	AC
Cadillac 370 B	—	134-140	Own	Har	O	12	3⅛x4	368.0	5.30	46.9	135@3400	CI	4	Cuno	AC	DL	AC
Cadillac 452 B	—	143-149	Own	Har	O	16	3 x4	452.0	5.36	57.5	165@3400	CI	5	Cuno	AC	DL	AC
Chevrolet	—	109	Own	No	O	6	3⅛x3¾	194	5.20	26.3	60@3000	CI	3	—	—	Car	AC
Chrysler 6	3120	116	§Own	Yes	L	6	3¼x4½	223.9	5.35	25.35	82@3400	*Alum	4	Pur	Yes	B & B	Yes
Chrysler 8	3860	125	§Own	Yes	L	8	3¼x4½	298.6	5.20	33.80	100@3400	*Alum	5	Pur	Yes	Str	Yes
Chrysler Imp. 8	—	135	§Own	Yes	L	8	3½x5	384.8	5.20	39.20	125@3200	*Alum	9	Pur	Yes	Str	Yes
Chrysler Imp. 8 cus.	—	146	§Own	Yes	L	8	3½x5	384.8	5.20	39.20	125@3200	*Alum	9	Pur	Yes	Str	Yes
Cord (Fr. Wh. D.)	4620	137½	Lyc	Dole	L	8	3¼x4½	298.6	5.25	33.8	115@3300	*Alum	5	Pur	AC	Sch	No
De Soto Six	3008	113	§Own	Yes	L	6	3¼x4¼	211.5	5.35	25.35	75@3400	*Alum	4	Pur	Yes	B & B	Yes
De Vaux 6-80	2810	114	Hall	Dole	L	6	3⅜x4	214.7	5.20	27.34	75@3600	Alum	4	—	Yes	Til	AC
Dodge Six D L	3084	114¼	§Own	Yes	L	6	3¼x4⅜	217.7	5.35	25.35	79@3400	Alum	4	Pur	Yes	Car	Yes
Dodge Eight D K	3488	122	§Own	Yes	L	8	3¼x4¼	282.1	5.20	33.80	90@3400	Alum	5	Pur	Yes	Str	Yes
Essex-Gr. Su. 6	—	113	†Own	—	L	6	2⅞x4¾	193.0	5.50	20.7	70@3200	Alum	3	No	Ste	Mar	AC
Ford A	2375	106½	Own	—	L	4	3⅛x4¼	200.5	4.22	24.03	40@2200	Alum	3	—	—	Zen	—
Ford V8	—	106½	Own	—	—	8	3⅛x3¾	221.0	5.50	30.0	65@3400	—	3	—	—	—	—
Franklin Airman	—	132	*Own	Ful	O	6	3½x4¾	—	5.10	—	100@3100	*Alum	7	Pur	Yes	Str	Yes
Franklin V-12	—	144	*Own	Ful	O	12	3¼x4	398.0	5.12	—	150@3100	*Alum	7	Pur	Yes	Str	Yes
Graham 6	—	113	Own	Yes	L	6	3⅛x4½	207	5.45	23.4	70@3200	*Alum	7	—	AC	Sch	AC
Graham, Bl-Str.	366	123	Own	Bish-Bab	L	8	3⅛x4	245.4	6.50	31.25	90@3400	*Alum	5	AC	AC	DL	AC
Hudson Greater 8	—	119-126-132	†Own	—	L	8	3 x4½	254.1	5.80	28.8	101@3600	Alum	5	No	Ste	Mar	AC
Hupmobile 216	—	116	Own	Bish-Bab	L	6	3⅜x4¼	228.1	5.00	27.34	75@3200	*Alum	4	**	Ste	Str	AC
Hupmobile 222	3580	122	Own	Bish-Bab	L	8	2⅞x4⅝	250.7	5.40	27.61	93@3200	Alum	5	Pur	Ste	Str	AC
Hupmobile 226	3755	126	Own	Bish-Bab	L	8	3⅛x4¾	279.9	5.47	30.10	103@3200	Alum	5	Pur	Ste	Str	AC
La Salle 345 B	—	130-136	Own	Har	L	8	3⅜x4⅛	353.0	5.38	36.4	115@3000	CI	3	AC	AC	Own	AC
Lincoln V-8	5430	136	Own	Yes	L	8	3½x5	384.0	5.23	39.2	125	Alum	5	No	AC	Str	AC
Lincoln V-12	5750	145	Own	Yes	L	12	3¼x4½	448.0	5.25	50.7	150@3400	Alum	7	No	AC	Str	AC
Marmon 8	3500	125	Own	Yes	L	8	3¼x4¾	315.2	5.50	33.8	125@3400	Alum	5	Flo	—	—	—
Marmon 16	5363	145	Own	Pines	O	16	3⅛x4	490.8	6.00	62.5	200@3400	Alum	5	†	AC	Str	AC
Nash Big Six	3200	116	Own	Bish-Bab	L	6	3⅛x4⅜	201.3	5.10	23.4	70@3000	*Alum	7	Pur	AC	Str	AC
Nash Stand. Eight	3400	121	Own	Bish-Bab	L	8	3 x4⅜	247.4	5.10	28.8	85@3200	*Alum	9	Pur	AC	Str	AC
Nash Spec. Eight	3870	128	Own	Bish-Bab	O	8	3⅛x4¼	260.8	5.25	31.2	100@3400	*Alum	9	Pur	AC	Str	AC
Nash Adv. Eight	4350	133	Own	Bish-Bab	O	8	3⅜x4½	322.0	5.25	36.4	125@3600	*Alum	9	Pur	AC	Str	AC
Nash Ambas. Eight	—	142	Own	Bish-Bab	O	8	3⅜x4½	322.0	5.25	36.4	125@3600	*Alum	9	Pur	AC	Str	AC
Oldsmobile F-32	3035	116½	Own	No	L	6	3⅛x4⅛	213.3	5.80	26.3	74@3200	CI	4	AC	AC	Str	AC
Oldsmobile L-32	3165	116½	Own	No	L	8	3 x4¼	240.3	5.90	28.8	87@3350	CI	5	AC	AC	Str	AC
Packard Twin Six	5225	142-147	Own	Yes	L	12	3⅛x3½	390.0	6.00	50.6	150@3600	*Alum	4	No	Yes	Own	AC
Packard Stan. 8	4570	130-137	Own	Yes	L	8	3⅜x5	320.0	6.00	32.5	110@3200	*Alum	9	Yes	Yes	Own	AC
Packard De L. 8	5045	142-147	Own	Yes	L	8	3½x5	384.8	6.00	39.2	135@3200	*Alum	9	Yes	Yes	Own	AC
Packard Light 8	4115	127¾	Own	Yes	L	8	3⅜x5	320.0	6.00	32.50	110@3200	*Alum	9	Yes	Yes	Own	AC
Peerless De L. Mas.	4521	125	Con	Bish-Bab	L	8	3⅜x4½	322	5.00	36.45	115@3200	*Alum	5	Pur	AC	Sch	AC
Peerless Custom 8	4766	138	Con	Bish-Bab	L	8	3⅜x4½	322	5.00	36.45	120@3200	*Alum	5	Pur	AC	Sch	AC
Pierce-Arrow 54	—	137-142	Own	Pines	L	8	3½x4¾	366	5.05	39.2	125@3000	*Alum	9	Pur	Ste	Str	AC
Pierce-Arrow 52	—	142-147	Own	Pines	L	12	3⅜x4	429	5.05	54.6	150@3200	*Alum	7	Pur	Ste	Str	AC
Pierce-Arrow 53	—	137-142	Own	Pines	L	12	3¼x4	398	5.05	50.7	140@3200	*Alum	7	Pur	Ste	Str	AC
Plymouth	2875	112	Own	No	L	4	3⅜x4¾	196.1	4.90	21.03	65@3000	Alum	3	Yes	AC	B&B	Yes
Pontiac 6	—	114	Own	—	L	6	3⅛x3⅞	200.0	5.10	26.3	65@3200	CI	3	—	AC	Mar	Yes
Pontiac V-8	—	117	Own	—	H	8	3⅛x3⅜	251.0	5.20	37.8	85@3200	CI	3	—	AC	Mar	Yes
Reo Fly. Cloud "S"	—	117	Own	—	—	6	3⅛x5	230.0	5.30	—	80@3200	Lo-Ex	7	Yes	Yes	Yes	Yes
Reo Royale 8-35	4650	135	Own	Pines	L	8	3⅜x5	358	5.30	36.48	125@3300	Alum	9	Han	AC	Sch	Own
Reo Royale 8-31	4375	131	Own	Pines	L	8	3⅜x5	358	5.30	36.48	125@3300	Alum	9	Han	AC	Sch	Own
Reo 8-21	3610	121	Own	Yes	L	8	3 x4¾	268.6	5.37	28.8	90@3300	*Alum	5	Han	—	Sch	Un
Reo 6-21	3525	121	Own	Yes	L	6	3⅜x5	268.3	5.30	27.3	85@3200	Alum	7	Han	—	Sch	Un
Reo Fly. Cloud 6-25	3950	125	Own	Yes	L	6	3⅜x5	268.3	5.30	27.34	85@3200	Alum	7	Han	V S	Sch	Un
Reo 8-25	4050	125	Own	Yes	L	8	3 x4¾	268.6	5.37	28.8	90@3300	*Alum	5	Han	V S	Sch	Un
Rockne 6-65	2595	110	Own	Dole	L	6	3⅛x4⅛	189.8	5.20	23.4	66@3200	CI	4	—	Ste	Str	No
Rockne 6-75	3000	114	Own	Dole	L	6	3¼x4⅛	205.3	5.10	25.4	72@3200	CI	4	—	AC	Str	No
Studebaker 6-55	3170	117	Own	Dole	L	6	3¼x4⅝	230.0	5.00	25.4	80@3200	CI	4	No	Ste	Str	No
Studebaker Dict. 62	3240	117	Own	Bish-Bab	L	8	3⅛x3¾	221.0	5.00	30.0	85@3200	CI	9	Pur	Ste	Str	AC
Studebaker Com. 71	3545	125	Own	Bish-Bab	L	8	3⅛x4¼	250.4	5.20	30.0	101@3200	°Alum	9	Pur	Ste	Str	AC
Studebaker Pres. 91	4260	135	Own	Dole	L	8	3½x4⅜	337.0	5.10	39.2	122@3200	*Alum	9	Han	Ste	Str	AM
Stutz LAA	4383	127½	Own	—	O	6	3⅜x4½	241.5	5.50	27.3	85@3150	*Alum	7	Pur	AC	Zen	Un
Stutz SV-16	4885	134½-145	Own	—	O	8	3⅜x4½	322	5.50	36.4	113@3300	*Alum	9	Pur	AC	Zen	AM
Stutz DV 32	5281	134½-145	Own	Bish-Bab	O	8	3⅜x4½	322	5.10	36.4	156@3900	*Alum	9	Pur	Ste	Sch	AC
Willys-Ov'land 6-90	2824	113	Own	—	L	6	3¼x3⅞	193.0	5.26	25.35	65@3400	CI	4	No	AC	Til	Til
Willys-Ov'land 8-88	—	121	Own	—	L	8	3⅛x4	245.4	5.26	31.25	80@3200	CI	5	No	AC	Til	AC
Willys-Kni. 66-D	—	121	Own	—	K	6	3⅜x4¾	255.0	5.50	27.34	87@3200	*Alum	7	Pur	Til	Til	AC
Willys-Knight 95	—	113	Own	—	K	6	2⅞x4⅜	177.9	5.55	20.70	60@3400	*Alum	7	Pur	AC	Til	Yes

New Dealers Appointed

NEW YORK

Studebaker — Carpenter's Garage, Hagaman; Joe's Garage, Florida; Samuel Corelli, Gowanda; Tucker & Murray Garage, Southampton; Donner Auto Sales Company, Lawrence; Joseph Kaplan, Amenia.

Auburn—Auburn Sales of Flushing, Flushing, Long Island; Mahoney Motor Sales, Inc., Yonkers; X. J. Bromley, Glens Falls; Norman L. Curtice, Hoosick Falls.

OHIO

Studebaker—A. W. Zechman, Bellevue.

Auburn—H. E. Thomas Company, Ashtabula; J. Stewart Main & Co., Ada.

OKLAHOMA

Auburn—J. W. Knox, Inc., Enid.

OREGON

Studebaker — Acme Motor Company, Klamath Falls; Armstrong Motors, Inc., Medford.

PENNSYLVANIA

Studebaker — Williamson Motor Sales, Brookville; Trattner Motor Sales, Du Bois.

Auburn—Stewart J. Walker, Somerset; Charles F. Feidt, Lewistown; O. B. Knittle, Pottsville.

RHODE ISLAND

Studebaker—Trinity Motors, Providence.

SOUTH CAROLINA

Studebaker—Fred A. Fuller, Inc., Spartanburg.

VERMONT

Auburn—Green Mountain Motors, St. Johnsbury.

VIRGINIA

Auburn—Reynolds Auto Service, Inc., Danville.

WEST VIRGINIA

Studebaker—A. X. Schuller, Romney.

Auburn—G. T. Knight Motor Company, Wheeling.

TEN MAKES OF CARS NOW USE CENTRIFUSE DRUMS

Detroit, May 2. — The motor Wheel Corporation announces that since the use of its Centrifuse brake drum was first made public by Chrysler, nine other makes of cars have adopted the drum as standard equipment. These are: Dodge, De Soto, Plymouth, Graham, Auburn, Nash, Packard, Reo and Franklin.

The manufacturer says that a number of other car builders are being lined up for Centrifuse equipment on their vehicles.

TRANSPORTATION COMMITTEE FOR PHILADELPHIA CHAMBER

Philadelphia, May 2. — A new transportation committee appointed by President P. H. Gadsden, Philadelphia Chamber of Commerce, includes every phase of transportation, as well as the industrial traffic group. Serving on this committee are, among others, the following: W. H. Brearly, Pennsylvania Motor Truck Association, Inc.; H. E. Boysen, Philadelphia Drayage & Express Corporation; R. S. Mawson, J. G. Brill Company; John C. Mooney, Davis Lupton Sons Company; James N. Naye, Philadelphia Team and Motor Truck Owners' Association; E. V. D. Sullivan, Terminal Warehouse Company, and C. H. Rolf, Edward G. Budd Manufacturing Company.

N. J. SERVICE STATIONS TO AID SAFETY CAMPAIGN

Trenton, N. J., May 2.—Service stations, co-operating with the State Department of Motor Vehicles, will begin during the next fifteen days the display of posters showing what happens when drivers cut out of line and attempt to pass other cars on a hill. These posters will appear at more than 5,000 stations in New York, New Jersey and Pennsylvania. It is part of the public safety educational campaign sponsored by the motor vehicles departments of the three states.

MIAMI PLYMOUTH DEALERSHIP MOVES

Miami, Fla., May 2.—W. C. Dorsey Motors, Inc., local Plymouth and De Soto dealership, has moved from 55 N. W. 1st St., to 115 West Flagler St., where more display space is available.

OF PRESENT AMERICAN PASSENGER CAR MODELS

Make and Model	Front End Drive	Ignition System	Gen. and Starter	Clutch	Transmission Make	Transmission Speeds	Transmission Type	Universals	Rear Axle	Ratio	Brakes	Steering Gear	Springs Rear	Spring Shackles	Chassis Lubric.	Tires
Auburn 8-100	Chain	Del-R	*Del-R-S	Long	D	3	SM-LGS-F	U	Col	*4.70	M	Ross	S 56¾	Own	Bijur	17x6.00
Auburn 12-160	Link	Del-R	*Del-R-S	Long	D	3	SM-LGS-F	M	Col ½	*4.55	Bendix	Ross	S 56¾	Own	Bijur	*17x6.00
Austin	Gear	Aut-L	*Aut-L	Rock	WG	3	——	S	Sal ½	5.25	M	Say-B	Cant	Own	Al-Z	18x3.75
Buick 32-50	Tex	Del-R	Del-R	*Own	O	3	SM-BW-F	O	Own ½	4.60	Own	Sag	S 56	Tryon	Al-Z	18x5 50
Buick 32-60	Tex	Del-R	Del-R	*Own	O	3	SM-BW-F	O	Own ¾	4.54	Own	Sag	S 55¼	Own	Al-Z	18x6.00
Buick 32-80	Tex	Del-R	Del-R	*Own	O	3	SM-BW-F	O	Own ¾	4.27	Own	Sag	S 58⅞	Own	Al-Z	18x7.00
Buick 32-90	Tex	Del-R	Del-R	*Own	O	3	SM-BW-F	O	Own ¾	4.27	Own	Sag	S 58⅞	Own	Al-Z	18x7.00
Cadillac 355 B	Morse	Del-R	Del-R	Own	O	3	SM-F	S	Own ¾	4.60	Own M	Sag	S 58	Own	Alem	17x7 00
Cadillac 370 B	Morse	Del-R	Del-R	Own	O	3	SM-F	S	Ov n ¾	4.80	Own M	Sag	S 58	Own	Alem	17x7.50
Cadillac 452 B	Morse	Del-R	Del-R	Own	O	3	SM-F	S	Own ¾	4.64	Own	Sag	S 60	Own	Alem	18x7.50
Chevrolet	—	Del-R	*Del-R	Own	O	3	SM-F	—	Own ½	——	—	Sag	S 54	——	Alem	18x5.25
Chrysler 6	Chain	Del-R	Del-R	*—	O	3	—— F	—	Own ½	4.60	H	Own	S 53⅜	——	Alem	18x5.50
Chrysler 8	Chain	Del-R	Del-R	*—	O	4	—— F	—	Own ½	4.30	H	Gem	S 54⅝	——	Alem	17x6.50
Chrysler Imp. 8	Chain	Del-R	Del-R	*—	O	4	—— F	—	Own ½	4.10	H	Gem	S. 57½	——	Al-Z	17x7.00
Chrysler Imp. 7 Cus.	Chain	Del-R	Del-R	*—	O	4	—— F	—	Own ½	4.10	H	Gem	S 57½	——	Al-Z	17x7.50
Cord (Fr. Wh. Dr.)	Link	Del-R	*Del-R	Long	D	3	——	*	Col F	4.80	H	Gem	S 62	Own	Bijur	18x7.00
De Soto Six	Chain	Del-R	Del-R	*Own	O	3	—— F	S	Own ½	4.62	H	Own	S 53⅜	——	Alem	18x5.25
De Vaux 6-80	Morse	Aut-L	*Aut-L	Borg	W	3	——	S	‡AD ½	4.40	M	†W	S 54¼	Tryon	Al-Z	19x5.25
Dodge Six D L	Chain	Del-R	—	—	O	3	—— F	—	Own ½	4.60	H	Own	S 54⅞	——	Al-Z	18x5 50
Dodge Eight D K	Chain	Del-R	Del-R	*—	O	3	—— F	—	Own ½	4.10	H	Gem	S 55	——	Al-Z	18x6.00
Essex Gr. Su. 6	Morse	Aut-L	*Aut-L-S	Own	O	3	SM-WG-F	S	Own ½	4.63	Bendix	Gem	S 54⅛	Own	Alem	18x5.25
Ford A	Var	Own	*Own	Own	O	3	——	S	Own ¾	3.78	M	Gem	S-Tr 39	Own	Al-Z	19x4.75
Ford V8	—	—	*—	—	—	—	——	—	—	—	—	—	—	—	Al-Z	18x5.25
Franklin Airman	Chain	Del-R	*Del-R-S	—	W	3	SM-BW-F	M	— ½	4.73	H	Gem	El 42	——	Al-Z	19x6.50
Franklin V-12	Chain	Del-R	*Del-R-S	Long	W	3	SM-BW-F	M	Col ½	4.45	H	Ross	S 60	Fafnir	Al-Z	17x7.50
Graham 6	Link	Del-R	Del-R	Long	WG	3	WG-F	U	Sal ½	4.45	H	Ross	S 54	ERS	Al-Z	17x5.50
Graham, Bl.-Str.	Link	Del-R	Del-R	Long	WG	3	SM-WG-F	S	Sal ½	4.30	H	Ross	S 54	ERS	Al-Z	17x6.00
Hudson Greater 8	Morse	Aut-L	*Aut-L-S	Own	O	3	SM-WG-F	S	Own ½	†4.63	Bendix	Gem	S 54⅛	Own	Alem	*17x6.00
Hupmobile 216	Chain	Aut-L	*A-L-S-§	Borg	WG	3	SM-WG-F	M	Spic ½	4.54	M	Ross	S 53	Tryon	Al-Z	18x5 50
Hupmobile 222	Morse	Aut-L	*A-L-S-§	Borg	WG	3	SM-WG-F	U	Own ½	4.36	M	Gem	S 57½	——	Al-Z	17x6.00
Hupmobile 226	More	Aut-L	*A-L-S-§	Long	D	3	SM-DG-F	U	Own ½	4.36	M	Gem	S 57½	——	Al-Z	17x6.50
La Salle 345 B	Morse	Del-R	Del-R	Own	O	3	SM-F	S	Own ¾	4.60	Own M	Sag	S 58	Own	Alem	17x7.00
Lincoln V-8	Chain	Aut-L	*Aut-L	Long	O	3	SM-F	S	Own F	4.58	*Bendix	Own	S 62	Own	Alem	18x7.00
Lincoln V-12	Chain	Aut-L	*Aut-L	Long	O	3	SM-F	S	Own F	4.58	*Bendix	Own	S 62	Own	Alem	18x7.50
Marmon 8	Diam	Del-R	*Del-R	*—	—	3	SM	S	Spic ½	4.08	Bendix	Ross	S 57	——	Alem	18x6.00
Marmon 16	Diam	Del-R	Del-R	*Rus	M	3	SM	S	Spic ½	3.78	Bendix	Ross	S 59½	——	Alem	18x7.00
Nash Big Six	Chain	Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.70	M	Ross	S 54	ERS	Alem	18x5.25
Nash Stand. Eight	Chain	Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.45	M	Ross	S 54	ERS	Alem	18x5.50
Nash Spec. Eight	Chain	*Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.43	Bendix	Gem	S 55¾	*	Bijur	17x6.50
Nash Adv. Eight	Chain	*Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.50	Bendix	Gem	S 57⅛	*	Bijur	18x7.00
Nash Ambas. Eight	Chain	*Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.50	Bendix	Gem	S 57⅛	*	Bijur	18x7.00
Oldsmobile F-32	Chain	Del-R	Del-R	Borg	M	3	SM-BW-F	S	Own ½	4.56	Bendix	Sag	S 54½	Tryon	Al-Z	17x6.00
Oldsmobile L-32	Chain	Del-R	Del-R	Borg	M	3	SM-BW-F	S	Own ½	4.77	Bendix	Sag	S 54½	Tryon	Al-Z	17x6.00
Packard Twin Six	Morse	—	*—	*Long	O	3	SM	—	Own ½	——	M	Own	S 60½	Own	——	19x7.00
Packard Stan. 8	Morse	N E	*Dyn	Long	O	4	SM	M	Own ½	4.66	M	Own	S 60½	Own	Bijur	6.50x19
Packard De L. 8	Morse	N E	*Dyn	Long	O	4	SM	M	Own ½	4.66	M	Own	S 60½	Owr	Bijur	7.00x19
Packard Light 8	Morse	N E	*Dyn	*Long	O	3	SM	M	Own ½	4.66	M	Own	S 56	Own	Alem	17x6.50
Peerless De L. Mas.	Morse	Aut-L	*Aut-L	Rock	WG	3	WG-F	S	Sal ½	4.45	Bendix	Ross	S 60	Rub B	Alem	31x6.00
Peerless Custom 8	Morse	Aut-L	*Aut-L	Rock	WG	3	WG-F	S	Sal ½	4.80	Bendix	Ross	S 60	Rub B	Alem	31x6.50
Pierce-Arrow 54	Chain	Del-R	*Del-R-S	Long	O	3	SM-F	S	Own ½	4.42	Bendix	Ross	S 61	Faf	Myers	18x6.50
Pierce-Arrow 52	Chain	Del-R	*Del-R-S	Long	O	3	SM-F	S	Own ½	4.42	Bendix	Ross	S 61	Faf	Myers	18x7.00
Pierce-Arrow 53	Chain	Del-R	*Del-R-S	Long	O	3	SM-F	S	Own ½	4.58	Bendix	Ross	S 61	Faf	Myers	18x7.00
Plymouth	Var	Del-R	Del-R	*Own	O	3	BW-F	O	Own ½	4.33	H	War	S 53⅜	——	Al-Z	18x5.25
Pontiac 6	Chain	Del-R	Del-R	—	—	—	SM-BW-F	—	Own ½	4.55	Bendix	Sag	S 54	Inlox	—	18x5.25
Pontiac V-8	Link	Del-R	Del-R	—	—	—	SM-BW-F	—	Own ½	4.22	Bendix	Sag	S 54½	—	—	17x6.00
Reo Fly. Cloud "S"	Chain	—	*—S	—	—	3	SM-F	—	Own ½	4.60	H	Ross	S 55	——	—	17x5.50
Reo Royale 8-35	Morse	Del-R	Del-R-§	Long	O	3	SM	U	Own ½	4.07	H	Ross	S 57½	Own	Far	6.50x18
Reo Royale 8-31	Morse	Del-R	Del-R-§	Long	O	3	SM	U	Own ½	4.07	H	Ross	S 57½	Own	Al-Z	6.50x18
Reo 8-21	Link	Del-R	*Del-R	Long	O	3	SM	U	Own ½	4.42	H	Ross	S 55¾	Tryon	Al-Z	17x6.00
Reo 6-21	Morse	Del-R	*Del-R	Long	O	3	SM	U	Own ½	4.07	H	Ross	S 55¾	Tryon	Al-Z	17x6.00
Reo Fly. Cloud 6-25	Morse	Del-R	*Del-R	Long	O	3	SM	U	Own ½	4.42	H	Ross	S 55¾	Own	Al-Z	17x6.50
Reo 8-25	Link	Del-R	*Del-R	Long	O	3	SM	U	Own ½	4.42	H	Ross	S 55¾	Own	Al-Z	17x6.50
Rockne 6-65	Morse	Aut-L	*Aut-L-S	Borg	O	3	SM-BW-F	M	Spic ½	4.27	Bendix	Ross	S 54	Tryon	Al-Z	18x5.25
Rockne 6-75	Chain	Aut-L	*Aut-L-S	Borg	O	3	SM-BW-F	M	Own ½	4.73	Bendix	Ross	S 54	Tryon	Al-Z	18x5.50
Studebaker 6-55	Chain	Del-R	*Del-R-S	Long	O	3	SM-BW-F	S	Own ½	4.27	Bendix	Ross	S 54	Tryon	Alem	18x5.50
Studebaker Dict. 62	Cel	Del-R	*Del-R-S	Long	O	3	SM-BW-F	S	Own ½	4.73	Bendix	Ross	S 54	Tryon	Alem	18x5.50
Studebaker Com. 71	Cel	Del-R	*Del-R-S	Long	O	3	SM-BW-F	S	Own ½	4.73	Bendix	Ross	S 56	Faf	Alem	18x6.00
Studebaker Pres. 91	Var-G	Del-R	*Del-R-S	Borg	O	3	SM-BW-F	S	Own ½	4.31	Bendix	Ross	S 60	Faf	Alem	18x6.50
Stutz LAA	Link	Del-R	Del-R	Borg	D	4	——	U	Sal ½	4.75	H	Gem	S 60	Own	Bijur	19x6.00
Stutz SV-16	Link	Del-R	Del-R	Long	M	3	SM	M	Tim ½	4.75	H	Gem	S 62¾	Own	Bijur	20x6.50
Stutz DV-32	Link	Del-R	Del-R	Long	M	3	SM	M	Tim ½	4.50	H	Gem	S 62¼	Own	Bijur	20x7.00
Willys-Ov'land 6-90	Link	Aut-L	*Aut-L	—	O	3	SM-BW-F	S	Own ½	4.60	Bendix	Own	S 51	Tryon	Alem	18x5.25
Willys-Ov'land 8-88	Link	Aut-L	*Aut-L	*Borg	O	3	SM-BW-F	S	Own ½	4.40	Bendix	Ross	S 56	Tryon	Alem	18x5.50
Willys-Kni. 66-D	Link	Aut-L	*Aut-L	—	O	3	SM-BW-F	S	Own ½	4.18	Bendix	Gem	S 56	Tryon	Alem	17x6.00
Willys-Knight 95	Link	Aut-L	*Aut-L	—	O	3	SM-BW-F	S	Own ½	4.89	Bendix	Gem	S 51	Tryon	Alem	18x5.50

KEY TO ABBREVATIONS

Weight — §Austin standard 2 passenger coupe. Stutz DV 145-inch wheel base weighs 5,352.

Wheel Base—*Over all length of chassis instead of wheel base, which manufacturers refuse to give.

Engine Make—Con. Continental; Lyc. Lycoming, Hall, De Vaux-Hall Motors Corp. *Air-cooled with spot temperature control. †Thermo syphon water circulation. ‡Floating power

Thermostat—Bish-Bab. Bishop & Babcock, Dole, Dole Valve Co., Chicago, Ill.; Ful, Fulton Co.; Har, Harrison; Pines, Pines Winterfront Var, various makes.

Valve Arrangement—L, L head; H, horizontal. O, overhead; K, sleeve valve; LV, V-type L head.

Piston Material—*Alum, aluminum with invar struts. Alum, aluminum alloy; CI cast iron; S. St, semi-steel; Lo-Ex, Aluminum Corporation of America.

Oil Purifier—Wal, Wall; Han, Handy; AC, AC Spark Plug Company; Ste, Stewart-Warner; Ski, Skinner; Flo, Floato; Cuno, Cuno Engineering Corp; Pur, Purolator. *Using both Floato and Skinner. †Using AC with Floato attachment. **Using both AC and Purolator.

Fuel Cleaner—AC, AC Spark Plug Co.; Gas, Gascolator; Ste, Stewart-Warner; Til, Tillotson; V-S, Van Sicklen.

Carburetor—Sch, Wheeler Schebler; Zen, Zenith; Mar, Marvel; Car, Carter; Str, Stromberg; DL, Detroit Lubricator; Til, Tillotson; B&B, Borg & Beck.

Air Cleaner—AC, AC Spark Plug Company; AM, Air Maze; Un, United; Til, Tillotson

Front End Drive—Link, Link Belt; Tex, Texolite; Cel, Celeron; Diam, Diamond Chain; Morse, Morse Chain Company; Var, various makes of chains; Var-G various makes of gears.

Ignition, Generator and Starter—Aut-L, Auto-Lite; A-L, Auto-Lite; Del-R, Delco-Remy; Dyn, Owen-Dyneto Corp.; N E, North East. *Nash.—Indicates twin ignition. *Bendix starter used. S—Startix equipped. §Startix optional equipment.

Clutch—Borg, Borg & Beck; Br-L, Brown-Lipe; Rock, Rockford Machine; Long Long Clutch Company; Rus, Russell Mfg. Co. *Bendix Clutch Control.

Transmission Make—D, Detroit Gear; WG Warner Gear Company; M, Muncie Gear Company; O, Own; N, New Process Gear Corp.; W, Warner Corp. *Franklin Transcontinent models are equipped with both Warner and Detroit 3 or 4 speed gear sets, according to body type.

Transmission Type—DG, Detroit Gear & Machine Co.; LGS, The LGS Corp.; F, Free Wheeling; SM, Synchro Mesh; BW Borg-Warner; NP—New Process Gear Corp.; WG, Warner Gear Co.

Universals—U, Detroit Universal Products; S, Spicer Mfg. Corp.; O, Own, M, Mechanics Universal Joint Company. *Cord using Detroit Universal Products and Mechanical Universal Joint Co.

Rear Axle—Col, Columbia; Sal, Salisbury; Spic, Spicer Mfg. Corp.; Tim, Timken; N.P., New Process Gear Corp.; ½, Semi-floating; &, & floating; F, Full floating; ‡Adams used on custom models.

Ratio—*Dual ratio optional; Hudson 132-in wheel base models have rear axle ratio of 5.10

Brakes—H, hydraulic; M, mechanical; Bendix, Bendix Brake Corp. *Equipped with Vacuum Booster.

Steering Gear—Gem, Gemmer; Ross, Ross Gear and Tool Company; Sag, Saginaw; Say-B Saylor-Beall Manufacturing Company; War, Warner; N.P., New Process Gear Corp. †Ross used on custom models.

Rear Springs — S, semi-elliptic; El, full elliptic; Cant, semi-cantilever; S-Tr semi-transverse.

Spring Shackles—Tryon, Willys-Morrow Company; Rub B, Rubber Shock Insulator Company; Faf, Fafnir Bearing Company; ERS, Eaton Products, Inc.; Inlox—Inland Mfg. Co.; *Tryon, front, ERS, rear. *Own, front, ERS, rear.

Chassis Lubricator—Alem, Alemite; Al-Z, Alemite Zerk; Bijur, Bijur Lubricating Corp.; Far, Farval. Myers—Chassis Lubricating Co.

Tires—Auburn 12, custom models equipped with 17x6.50. *Hudson 132-in. wheel base models equipped with tires 17x6.50. Stutz 145-inch wheelbase models have 20x7.00 tires

NATIONAL OIL SUPPLY CO. HOST TO 150 DEALERS

Paterson, N. J., May 2.—Upward of 150 independent service station owners were in attendance at the dinner sponsored by the National Oil Supply Company of New York, distributor of Quaker State oil for New York and New Jersey. The speakers included Arthur Phillips, president of the National Oil Supply Company; Frank Dale, Eastern sales manager; William Ford, Eastern representative of the Quaker State Oil Company; Capt. Frank Hare, lubrication engineer, and Joseph H. Quackenbush, representing the local automobile supply dealers.

GASOLINE CONSUMPTION GAINS IN BAY STATE

Boston, Mass., May 2.—Gasoline consumption in Massachusetts during the first four months of this year was 10,243,101 gallons more than in the same months of 1931. The figures are 152,168,544 gallons, against 141,925,443 gallons last year. Translated into mileage at the average of twelve miles per gallon, motorists in the state traveled 122,917,212 miles more than in 1931.

TAKES GRAHAM IN UTICA, N. Y.

Utica, N. Y., May 2. — The Hughes-French Corporation, former distributor for Ford, has signed a franchise as distributor for Graham in Utica and vicinity territory. The corporation continues without Glen W. Hughes, a former stockholder and officer. C. M. French is president of the reorganized concern, with George Bemas as treasurer. The firm also distributes Plymouth cars.

NEW CHEVROLET DEALER

Sioux City, Ia., May 2. — R. A. Morton and son, J. K. Morton, have established the Morningside Chevrolet company, at 4118 Morningside Ave., and will carry a complete line of Chevrolet products.

FERRO ALLOYS IN THE STEEL FOUNDRY

(Continued from Page 5)

about the middle of the nineteenth century and appeared to be indispensable in steel production. In the latter part of the nineteenth century austenitic manganese steel was discovered and widely adopted where extreme toughness, coupled with resistance to abrasion, was necessary. Recently Dr. F. M. Becket described the properties of a 10 per cent. manganese 18 per cent. chromium steel which combined resistance to oxidation and hot sulphurous vapors in addition to the usual properties of soft sheet steel. Of the many grades of steel featuring manganese, those made with 1 per cent. to 2 per cent. predominate from the standpoint of tonnage, a rather significant record. In this grade we obtain a flexibility of control with either extreme hardness or toughness through an adjustment of the carbon while melting, and heat treatment after solidification. Further additions of chromium and silicon to this steel increase shock resistance, the elastic limit and general physicial properties at a nominal increase in cost.

In some respects, silicon is similar to manganese; in others, it is totally different. Its affinity for oxygen and ability to dissolve gases is far more intense and it does not combine with carbon under ordinary steel making conditions. In cast iron we find this resistance so strong that carbon is expelled from solution when silicon is added and ample time is allowed to establish equilibrium conditions at high temperatures. Silicon and manganese react entirely different toward sulphur. When silicon is added as a softening agent to cast iron its effect is governed by the amount of sulphur present, while manganese unites directly with sulphur and prevents it from absorbing oxygen, which is the cause of most of the trouble in high sulphur iron of steel.

During the last decade considerable attention and study has been directed toward the reaction products formed by the addition of manganese and silicon, with interesting results. It has always been known that these two elements rapidly form oxides when added to molten steel, but it remained for Dr. C. H. Herty, Jr., to show that they are far more effective as scavenging agents when they are added as a combined alloy within prescribed proportions to each other; that is, the oxides or compound will possess those characteristics which promote their certain removel, leaving the steel freer from objectionable inclusions that diminish both physical and chemical properties. While the ratio of these two elements has been fairly well established, another interesting point passed unnoticed. In the writer's experience the effectiveness of these special combinations is intensified as the per cent. of carbon in them decreases. Theoretically, standerd ferro-manganese is a solution of manganese carbide in iron, and when added as a deoxidizer the manganese and carbon must first be separated chemically, which requires heat, before they will combine with oxygen. In numerous instances, careful observers have noted an improved result through the use of low carbon combination alloys.

An interesting reaction occurs with the introduction of ferrosilicon and should not be overlooked. The greater the concentration of silicon, the more heat generated by the addition. This result is highly important in the production of some special steels, but should receive more attention in the production of ordinary grades of steel. Silicon primarily confers solidity on steel castings because of its ability to hold gases in solution. Although the average analysis of steel castings shows .30/.40 per cent. silicon, there is usually an uncertainty as to the condition in which this silicon exists in the metal. If combined with oxygen, the casting will appear dirty under the microscope. If saturated with gas when the steel is liquid, the casting may be porous when solid, due to the rejection of these gases when cooling. (Solubility is a function of the temperature.) If combined with iron, the highest efficiency is obtained

(Continued on Page 10)

Ferro Alloys in the Steel Foundry

(Continued from Page 9)

per unit of silicon. Excellent control can be maintained by regulating the time of the addition.

Ordinary carbon steel castings have unquestionably played an important part in the development of the country's industries and have withstood years of abuse that could not have been met with cast iron or some other less ductile material, but there are definite limits in resistance to forces tending toward their destruction which can and have been overcome through the use of special alloying agents. Higher tensile strength can be developed without a corresponding loss of ductility through the introduction of chromium; fatigue resistance is improved by adding vanadium; density or solidity is developed with aluminum, but these elements also effect other changes not to be forgotten.

Chromium exerts practically no deoxidizing effects during the melting stages but unites with carbon and dissolves in iron; it also absorbs nitrogen if present and zirconium is often added to chrome steels to counteract this reaction. The hardening influence of chromium up to 6 per cent. is governed by the percentage of carbon present; that is, a steel containing .50 per cent. carbon is hardened more rapidly with small increments of chromium than a steel of .20 per cent. carbon. Chromium steels do not conduct heat readily and longer periods of heating are necessary before quenching, but when quenched the depth of hardness is much greater than in carbon steels. The grain size depends primarily on the casting temperature, but also on the time allowed for solidification and the amount of carbon present.

When chromium is combined with nickel, molybdenum or vanadium in steel in suitable proportions, one alloy augments the influence of the other. Probably the chrome-nickel series is the best known, although straight chrome steel containing around 3 per cent. chromium possesses excellent properties and by regulating the carbon between .20 per cent. and .50 per cent. a wide range of physical properties may be obtained at a comparatively low cost.

In April, 1929, Mr. D. Zuege presented a paper on "Alloy Cast Steels" to the American Foundrymen's Association in which he pointed out the merits of a number of alloy combinations. Mr. R. H. Aborn prepared a paper for the Iron Age in 1925 to show the influence of individual and combination alloys. Many others of equal value have been printed, but they are all based on the assumption that high strength, ductility or resistance to particular constructional influence are demanded, whereas the effect on machinability, shrinkage, weldability or fluidity are equally important to the average foundryman.

An exceptionally tough or soft steel casting is more difficult to machine than one of medium hardness because the coherent grain strength is high. Cast iron is far easier to machine than steel for two reasons: the distribution of the graphitic carbon breaks up the metallic continuity and the graphite acts as a lubricant. In steel, the grains are often separated by hard siliceous impurities that resist the forward motion of the tool. Heat treatment will not eliminate these inclusions, but it may be used to develop a structure more amenable to cutting. Alloys that have a tendency to unite with carbon enhance these possibilities.

Irregularities in the structure also diminish machinability; usually, these irregularities are the result of segregation, particularly in heavy sections of metal. Primary segregation occurs above the melting point and is particularly noticeable in steels with a high percentage of carbon; in other words, steels that display excellent fluidity at pouring temperatures. Carbon, boron, manganese, sulphur and phosphorus are the chief offenders here, while chromium, vanadium, nickel, tungsten, silicon, molybdenum and zirconium exert opposite effects.

In regard to shrinkage, temperature plays the most important part because liquid contraction varies with the spread in tempertaure between pouring and solidification while solid contraction varies in a much smaller degree and can be corrected by increasing or decreasing pattern sizes. Uniform pouring temperature is a decided advantage in the foundry and is within the ability of melters to control if they give more attention to the dimensions of the ladel and the number and size of modls. Every ladel of steel should be held a definite length of time before casting to permit insoluble particles to rise to the surface and the steel should be hot enough when tapped to allow for the temperature drop in this interval. A temperature study in the shop with a pyrometer will reveal considerable information on this point which may be used as a basis for the loss of temperature before casting. Cleaning room costs, solidity, segregation, as well as "misruns" are all affected by this matter of pouring temperature to a greater extent than ordinarily known.

Perhaps foundrymen have given less attention to grain size than ingot producers, but it is believed this quality of steel deserves further investigation. At the present time we know steels with high shock resistance possesses a small grain size while steels that must resist destruction by oxidation at high temperatures should have a large grain if possible; frequently, however, strength at high temperatures is also necessary and a small grain results from some additional element used to secure the extra strength. In some respects, steel with a large grain responds more readily to heat treatment and is easier to machine. This latter point is not always true. Vanadium and aluminum always decrease grain size and nickel usually imparts similar effects, but silicon in appreciable quantities, as well as chromium, enlarges the grain in cast structures. It is not known exactly how these elements function. Some believe they increase the number of solid nuclei throughout the metal during solidification and increase the rate of freezing; others have claimed oxides are formed which have higher melting points and exist as colloids.

Many questions have been asked about the use of aluminum as its use has been considered objectionable because it tends to form oxides which lower the ductility of the castings. In some work, aluminum is essential to the production of solid castings. Without some gas solvent in the metal at the time it enters the mold, the sudden release of mold gases will usually penetrate the metal and cause skin holes. These conditions are, of course, more prominent in a shop producing small intricate parts that require either better fluidity or higher temperature than heavier castings. A few calculations will show that the moisture in ordinary green sand one inch square by one-eighth of an inch thick will expand to 315 cubic inches if raised to 2000 degrees Farenheit. To relieve the pressure generated by the formation of these gases, the permeability of the sand must be of a very high order to permit their escape and in some cases the shape of the castings is such that this is impossible.

Without the foundryman's art we would unquestionably be seriously handicapped in the production of thousands of products, for the ability to form intricate shapes direct from liquid steel permits economy of construction. When we add further a few alloys to the steel, we place in the hands of the designer a new implement with which he can build higher structures, engines with double or treble the power that weigh no more and machines that resist many of the destructive forces in the various industrial plants.

Those who have entered the alloy steel-casting field have met new problems not thought of prior to their initial experiments, but generally they have found the work interesting. Their field of customers has been extended, and eventually they are able to develop special products. It seems pertinent here to call attention to an objection sometimes presented; namely, the original cost of the alloys.

Cumulative New Commercial Car Registration Statistics, March, 1932

Returns for today: Mississippi and New York.

Figures in this table are from R. L. Polk & Co. of Detroit, with the exception of Illinois, which are supplied by the Robinson Advertising Service, Springfield, Ill., and New Jersey, which are furnished by the New Jersey Motor List Co., New Car Division, Trenton, N. J. Metropolitan district figures compiled by Sherlock & Arnold are included in New York state total. Readers desiring county, city or town lists, or lists of owners in any given section, may obtain these by addressing any of these three companies. Some of this data has been published previously, but it is given here complete for the convenience of our subscribers. Commercial car figures do not include busses.

In this table, 44 states and the District of Columbia.. Comparative figures for February, 1931, will be found on Page 11.

States	Autocar	Brockway	Chevrolet	Diamond-T	Dodge	Federal	Ford	G. M. C.	Indiana	International	La France Republic	Mack	Pierce-Arrow	Reo	Sterling	Stewart	Studebaker	White	Willys-Overland	Miscellaneous	Totals	States
Alabama			89		8	1	32	5		15							3		1		154	Alabama
Arizona			30		3		13			5										1	52	Arizona
Arkansas			44		1		29	1		8		1									84	Arkansas
California	6		311	2	46	2	368	31		47	6	1		40	2		12	9		83	966	California
Connecticut	3		100	3	14	6	49	9		26	1	4	1	12			4	3	3	2	240	Connecticut
Delaware		1	24		1		17	3		8				2							56	Delaware
Florida			92		5	1	124	4	1	21	1	1		3			2	1	1	3	260	Florida
Idaho			26				10			5											41	Idaho
Illinois	1		308	24	39	1	177	35		118	1	3		19	1	1	14	2	9	27	780	Illinois
Indiana	1		191		16	1	177	27	5	60	4			5		4	20	1	9	3	524	Indiana
Iowa			194	4	10		121			53		3		7			8	2	6	12	420	Iowa
Kentucky			51		5		48	3	3	25		2		3		1	2		2	2	147	Kentucky
Louisiana			49	1	5		38	3		20		1		1			1	1			120	Louisiana
Maine			88		12		32	7		16				4	1		2				162	Maine
Maryland	3	3	125		19	6	42	7		27	1	6		5			3	2		7	256	Maryland
Mass'setts	11	3	216	3	36	13	211	43		51		12		18	2	10	8	19	1	5	662	Mass'setts
Michigan			208	6	60	10	180	18	1	29				18			17	1	6	16	570	Michigan
Minnesota			228	7	40	5	152	11		81		6		14	1		12	7	6	1	571	Minnesota
Mississippi			62		4		48			16											130	Mississippi
Missouri	3		616	22	50	7	376	37	7	150		5		24	8	1	17	4	10	15	1352	Missouri
Montana			61		11	2	81	2	1	29				9			1	1	2	1	201	Montana
Nebraska			87	3	6		67	7		30				2			3		5	2	212	Nebraska
Nevada			18		1	1	4	2		3										1	30	Nevada
New Hamp.			44	6	6	1	20	4		7	1	1		2		3	2		1	1	99	New Hamp.
New Jersey	9	6	260	33	38	4	119	22		44	1	9	1	17	2	6	5	14	2	30	622	New Jersey
New Mexico			15		1		17	2		3											38	New Mexico
New York	105	33	506	30	100	12	387	74		138		45		36	5	52	23	447	16	60	2069	New York
No. Carolina			171	2	8		87	4		11	1	1		2				9		25	321	No. Carolina
North Dakota			25		4		7	1		18				2					2		59	Nor. Dakota
Ohio	1		225	2	48	2	195	28	1	50	1	4		14		6	6	9	7	45	644	Ohio
Oklahoma			72		5		65	2		14				1						2	161	Oklahoma
Oregon			59		6		62	8		9					3			2		1	150	Oregon
Pennsylvania	14	10	508	13	90	5	415	43		151	6	27		49	8	19	18	15	26	36	1453	Pennsylvania
Rhode Island		1	40	1	2	4	26	4		9		2	1	6			1	1	1	2	101	Rhode Island
So. Carolina			47		8		27	1		2								1		1	87	S. Carolina
South Dakota			33	2	4		9	17		17		1					3		4		90	S. Dakota
Tennessee			60		6	3	27	3	1	17				1				1	3	1	123	Tennessee
Texas			296	1	16		204	10	1	56		1		6			3	5		10	609	Texas
Utah			51		4		22	4		11		2					1				95	Utah
Vermont			38	3	2		18	2		13				2					3	1	82	Vermont
Virginia	5		183		12	1	100	7		12	1			6			3			4	334	Virginia
Washington			60	3	12	1	83	8		18		1		1			5	5		14	211	Washington
West Virginia	1		75		8	1	32	5		13	2						4		2	4	147	W. Virginia
Wisconsin			230	10	20	1	135	9		46	1	1		8	3	2	11	1	7	8	493	Wisconsin
Dist. of Col.	2		62	3	5	1	38	9		38										11	169	Dist. of Col.
Totals	165	57	6278	184	797	92	4491	522	21	1540	28	140	3	339	36	105	214	563	135	437	16147	Totals

HOW MUCH POWER CAN AN ENGINE PRODUCE?

(Continued from Page 5)

water under normal and abnormal cooling on brake mean effective pressures and octane number of the fuel required. The same cylinder was used throughout these tests.

Similar cooling is not generally effective in multicylinder engines as built at present. Recent tests indicate that the cooling medium is vaporized due to improper circulation of the heat-carrying medium. With the formation of vapor bubbles the efficiency of the cooling system is materially reduced.

The effect of valve and piston cooling on power is illustrated in Fig. 6 for a range of air-fuel ratios.

The answer to the question or title of this paper as illustrated on the graph involves higher compression for further increases in power, whether the actual power characteristics of the engine is equal to or lower than the maximum theoretical power valves shown. The heat balance of the high compression engines shows a greater percentage of the energy in the fuel is converted into power, having a smaller percentage for dissipation in the exhaust and cooling systems. Accompanying these inherent characteristics is a decrease in fuel consumption. Fig. 7 shows a heat balance for a small eight-cylinder engine at compression ratios of 5.2, 6.0 and 7.0 to 1. The decrease in exhaust gas temperatures with increase in compression ratio is contrary to popular belief. The facility with which high compression engines are cooled is of great importance in automobiles where conventional radiator size does not permit the ready dissipation of heat due to increased engine power. In airplane engines the smaller specific heat rejection to the jacket is of even greater importance because of the air resistance introduced by the frontal area of the radiator.

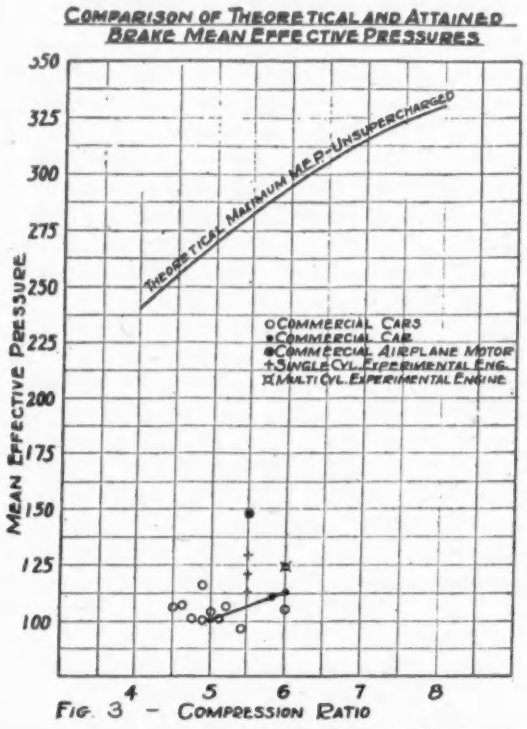
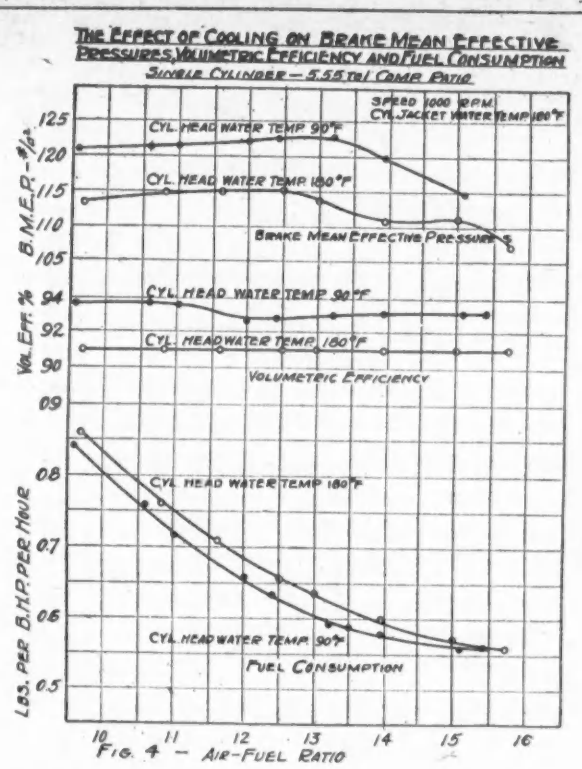


FIG. 3 - COMPRESSION RATIO


THE EFFECT OF COOLING ON BRAKE MEAN EFFECTIVE PRESSURES, VOLUMETRIC EFFICIENCY AND FUEL CONSUMPTION
SINGLE CYLINDER — 5.55 TO 1 COMP. RATIO
SPEED 1000 R.P.M.
CYL. JACKET WATER TEMP. 180°F
CYL. HEAD WATER TEMP. 90°F
CYL. HEAD WATER TEMP. 180°F
BRAKE MEAN EFFECTIVE PRESSURES
VOLUMETRIC EFFICIENCY
FUEL CONSUMPTION
B.M.E.P.-#/in²
VOL. EFF. %
LBS. PER B.H.P. PER HOUR
FIG. 4 - AIR-FUEL RATIO

In addition to the foregoing improvements higher compression reduces average crank pin pressures. Since the product of average bearing pressure, coefficient of friction, circumference of bearing and speed equals the work required of a bearing this reduction in crank pin pressure decreases the work to be done by the bearing which, in turn, decreases working temperatures. For every 778 foot-pounds of bearing work one B. T. U. of heat must be dissipated. Any reduction of bearing work then, through decreased pressures, improves the bearing factor of safety and decreases the burden on two of the functions of a lubricant—that of reducing bearing friction and removing heat from the point of generation to the point of dissipation.

Fig. 8 shows the pressure on the master crank pin of a 9-cylinder air-cooled engine operating at compression ratios of 5.5 and 7.0 to 1 at 1,900 r. p. m. It will be noted that the actual average bearing pressures are less than the inertia forces alone. In other words, if the engine were rotated at a speed of 1,900 r. p. m. without compression or firing the bearing pressures would be larger than during actual operation at full throttle. The increase in compression ratio from 5.5 to 7.0 to 1 reduces the average bearing pressure from 17,600 pounds to 16,300 pounds or 7.38 per cent.

Figs. 9, 10 and 11 show similar data for a seven-cylinder radial engine at compression ratios of 5.5 and 7.0 to 1 and speeds of 1,485, 1,800 and 2,200 revolutions per minute, respectively. At 1,485 revo-

(Continued on Page 12)

Cumulative New Commercial Car Registration Statistics, March, 1931

This table is repeated for comparative purposes only. Figures for March, 1932, will be found on Page 10.

States	Autocar	Brockway	Chevrolet	Diamond-T	Dodge	Federal	Ford	G. M. C.	Indiana	International	La France Republic	Mack	Pierce-Arrow	Reo	Sterling	Stewart	Studebaker	White	Willys-Overland	Miscellaneous	Totals	States
Alabama, 1931			139			1	123	1		10		1		1					2		278	Ala., 1931
Arizona, '31			44		2		92	3		8				1			3				153	Arizona, 31
Arkansas, 1931			80		8		136	1		10								1			236	Ark., 1931
California, '31	5		406	2	97	8	1309	29		43	1	9	1	32	17	4	23	13	14	82	2095	Calif., 1931
Conn., 1931	3	2	117	5	29	4	222	5		24	2	19	1	11		5	9	5	4	2	469	Conn.
Del., 1931	1		36		2		53	2		9		2		2			1				103	Del., 1931
Florida, 1931		2	125		11	2	217	4		11		2					1	4		2	381	Florida, 1931
Idaho, 1931			28		5		87	2		7	1			2					6	1	139	Idaho, 1931
Illinois, 1931	3	6	470	23	63	9	655	28		130	1	3		12	7		22	7	16	47	1502	Illinois, 1931
Indiana, 1931		5	417	2	52	2	450	14		95	2			4		9	13	3	18	9	1095	Indiana, '31
Iowa, 1931		1	336	4	31		334	2		79		6		9			13	1	6	7	829	Iowa, 1931
Kentucky, '31			104	1	18	1	142	8		21		11		3			6	1	1	3	320	Kentucky, '31
Louisiana, '31			120		4		170	3		41		5						4	1	1	349	La., 1931
Maine, '31			158		19		244	1		14				5		1	7	1			450	Maine, '31
Maryland, 1931	12		150	6	15	5	192	7		29		8		5		1	4	2	6	8	450	Maryland, '31
Mass., 1931	20	11	239	1	69	7	752	35		59		12		24	7	6	10	9	4	20	1285	Mass., 1931
Michigan, '31			265	2	39	8	625	12		47	5	3		13		2	4	5	6	17	1053	Mich., 1931
Minnesota, '31			437	7	58	3	527	14		104	2	1		16			20	4	25	12	1230	Minn., 1931
Mississippi, '31		1	86		2		77	1		12							1				180	Miss., 1931
Missouri, 1931	2	9	655	29	77	7	609	22		111	3	6	1	10	4	1	15	3	11	20	1595	Mo., 1931
Montana, 1931			78		8		76	1		28		2		4			4	2	4	2	209	Ment., 1931
Nebraska, 1931			137		25		211	7		32		2		1			8	2	6	5	436	Neb., 1931
Nevada, 1931		1	11		2		52	1		3							1	1		3	75	Nevada, '31
N. Hamp., '31		1	86	1	8		103	2		6		3		6		5	5				224	N. H., 1931
N. Jersey, '31	8	7	283	9	54	5	546	30		42	2	14		7	2	4	15	15	7	34	1082	N. Jer., 1931
N. Mex., 1931			29	2	4		62	1		11				1						1	111	N. Mex., '31
New York, '31	28	55	774	29	177	15	1526	62		181	3	109	2	36	8	47	57	42	22	120	3273	N. Y., 1931
No. Ca'lina, '31		1	219		23		247	7		19		1		1				4	2	9	533	N. Ca'lina, '31
Nor. Dak., '31		3	48	1	5		47	2		28							2		2		138	Nor. Dak., '31
Ohio, 1931	4	11	319		48	6	557	20		96		7		14	6	14	19	8	28	37	1194	Ohio, 1931
Oklahoma, '31			116	2	16	2	176	3		26		1					1	3	3	1	350	Okla., 1931
Oregon, 1931			48		8	2	120	2		12		8		3	2		3	2	1	7	218	Oregon, 1931
Penn., 1931	25	17	542	2	145	13	960	27		108	6	35	2	28	2	15	22	24	24	28	2025	Penn., 1931
Rh. Isle, 1931	2	4	30	1	14	7	112	4		2		1		10			6		1	1	195	Rh. Isle., '31
So. Car., 1931			103		14		112	1		5				2				1		5	243	So. Car., '31
S. Dakota, '31			65	1	9		59	3		26		2		2			9			1	177	S. Dak., 1931
Tennessee, '31		2	90		8		57	2		12		1		1			2				175	Tenn., '31
Texas, '31			540		37	6	640	7		150	1	3		5		1	11	15	3	23	1442	Texas, '31
Utah, 1931			77		10		124	9		7		4	1	3			4	2	1	3	245	Utah, 1931
Vermont, 1931			39		7		43			7				3					3		102	Vermont, '31
Virginia, 1931	3	5	215		21		242	12		33	3	2				1	2	11	2	20	572	Virginia, '31
Wash., 1931			100		27	4	254	5		17		2		4			13	2		19	447	Wash., 1931
West Va., 1931			77	6	15		109	6		21							7	1	5	1	248	West Va., '31
Wisconsin, '31		2	341	5	26	4	433	17		56				13	2	3	19	2	30	20	973	Wis., 1931
D. of C., 1931	3		34	1	2		93	4		11	1	1		1			2	1		3	157	D. of C., 1931
Totals	119	146	8813	142	1314	121	13977	429	*	1803	33	286	8	295	57	119	340	201	264	574	29041	Totals

Combined report on Brockway-Indiana.

HOW MUCH POWER CAN AN ENGINE PRODUCE?

(Continued from Page 11)

lutions per minute the bearing pressures during full throttle operation are larger than the inertia forces and slightly larger for the higher compression. Normally, however, this engine would operate only at partial throttle at speeds as low as 1,488 revolutions per minute, thus reducing the bearing pressures to a very low value. At 2,200 revolutions per minute the higher pressures of the 7.0 to 1 compression ratio reduce the average bearing pressure 985 pounds from the pressure due to inertia forces alone.

Fig. 12 shows the crank pin pressure due to inertia forces alone and the gas and inertia pressures combined for an eight-cylinder automobile engine now in production, at compression ratios of 5.5 and 7 to 1. It will be noted that at an engine speed of 2,550 revolutions per minute, the inertia forces become greater than the combined inertia and gas pressure under wide open throttle at 7 to 1 compression ratio. At higher speeds the beneficial effect of the increased compression pressures becomes apparent. At the lower speeds, the average bearing pressure is greater with combined gas and inertia pressure when the engine is operating at full throttle but, except during acceleration and hill climbing, the throttle is only partially opened at the lower engine speeds, hence the actual bearing pressure would usually be lower.

To the uninitiated it might appear that with decrease in crank pin pressures with increase in compression ratio it would not follow that increased power would result. Computations based on the pressures shown in the graphs show that even with reduced crank pin pressures increased torque and consequently increased power will result. The answer is one involving the direction of application of forces.

The increased power resulting from an increase in compression ratio is shown in Fig. 13. Additional potential power of the engine at the corresponding speed is available for acceleration of the vehicle. The power required to drive a vehicle at constant speed along a highway is utilized in overcoming the air resistance of the car and the frictional resistance of the chassis. The top speed of the car in each case is determined by the intersection of the former curve with the curve of engine power. It will be noted that the increased compression ratio results in a substantial increase in top speed.

(To Be Continued)

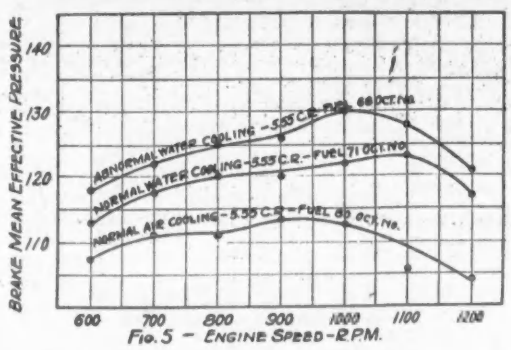


Fig. 5 — Engine Speed - R.P.M.

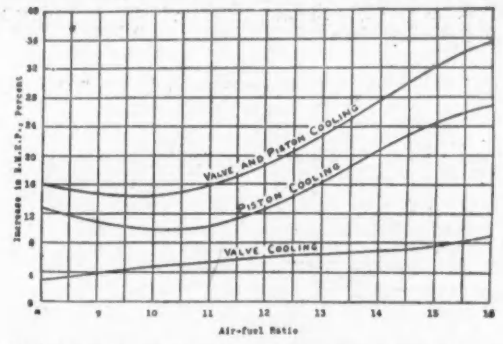


Fig. 6 — Effect of Abnormal Cooling of Piston and Exhaust Valve on Brake Mean Effective Pressure of Throttled Engine for Equal Knocking Tendency.

CURRENT PRICES OF PASSENGER CAR MODELS

AUBURN—8-cyl. 127 W. B.
8-100 Standard Models

Business Coupe	945	5 Phaeton Sedan	1,195
5 2-dr. Brougham	995	Speedster	1,195
4 Full Sedan	1,045	7 Sedan (136	
Cus. Type Cabri	1,095	W. B.)	1,245

AUBURN—8-cyl. 127 W. B.
Custom 8-100 Dual Ratio Models

Business Coupe	1,145	5 Phaeton Sedan	1,395
5 2-dr. Brough.	1,195	Speedster	1,395
4 Full Sedan	1,245	7 Sedan (136	
Cus. Type Cabri	1,295	W. B.)	1,445

AUBURN—12-cyl. 133 W. B.
12-160 Standard Models

Business Coupe	1,445	Cus. Type Cabri	1,595
5 2-dr. Brough.	1,495	5 Phaeton Sedan	1,695
4 Full Sedan	1,545	Speedster	1,695

AUBURN—12-cyl. 133 W. B.
Custom 12-160 Dual Ratio Models

Business Coupe	1,645	Cus. Type Cabri	1,795
5 2-dr. Brough.	1,695	5 Phaeton Sedan	1,895
4 Full Sedan	1,745	Speedster	1,895

AUSTIN—4-cyl. 75 W. B.

Business Coupe	330	Runabout	395
4 Sedan	395	De Luxe Coupe	525
Standard Coupe	395	2 Cabriolet	550

BUICK—8-cyl. 114 W. B.
Models 32-50

2 Business Coupe	935	4 Con Cp Rdst	1,080
5 Sedan	995	5 Spec Sedan	1,080
4 Spec Coupe	1,040	5 Con Phaeton	1,090
5 Vic Coupe	1,060	5 Spt. Phaeton	1,155

BUICK—8-cyl. 118 W. B.
Models 32-60

2 Bus. Coupe	1,250	5 Sedan	1,310
4 Spec Coupe	1,290	5 Con. Phaeton	1,310
4 Con. Cp. Rdst	1,310	5 Spt. Phaeton	1,390

BUICK—8-cyl. 126 W. B.
Models 32-80

4 Vic. Trav. Cp	1,540	5 Sedan	1,570

BUICK—8-cyl. 134 W. B.
Models 32-90

7 Spt. Phaeton	1,675	5 Club Sedan	1,820
4 C'try Club Cp.	1,740	5 Con Phaeton	1,830
5 Vic. Coupe	1,785	7 Sedan	1,955
4 Con Cp. Rdst.	1,805	7 Limousine	2,055
5 Sedan	1,805		

CADILLAC—V-8, Series 355 B. 134 W. B.
Fisher Bodies

2 Coupe	2,795	2 Roadster	2,895
5 Stan. Sedan	2,895	2 Con. Coupe	2,945

CADILLAC—V-8, Series 355 B. 140 W. B.
Fisher Bodies

5 Coupe	2,995	7 Sedan	3,145
5 Stan. Phaeton	2,995	5 Spt. Phaeton	3,245
5 Spec. Sedan	3,045	7 Imperial	3,295
5 Town Sedan	3,095	5 A. W. Phaeton	3,495
5 Spec. Phaeton	3,095		

CADILLAC—V-8, Series 355 B. 140 W. B.
Fleetwood Bodies.

5 Sedan	3,395	5 Town Cabriol.	4,095
5 Town Coupe	3,395	7 Town Cabriol.	4,245
7 Sedan	3,545	7 Lim. Brough.	4,245
7 Limousine	3,745		

CADILLAC—V-12, Series 370 B. 134 W. B.
Fisher Bodies

2 Coupe	3,495	2 Roadster	3,595
5 Stan Sedan	3,595	2 Con. Coupe	3,645

CADILLAC—V-12, Series 370 B. 140 W. B.
Fisher Bodies

5 Coupe	3,695	7 Sedan	3,845
5 Stan. Phaeton	3,695	5 Spt. Phaeton	3,945
5 Spec. Sedan	3,745	7 Imperial	3,995
5 Town Sedan	3,795	5 A. W. Phaeton	4,195
5 Spec. Phaeton	3,795		

CADILLAC—V-12, Series 370 B. 140 W. B.
Fleetwood Bodies

5 Sedan	4,095	5 Town Cabriol.	4,795
5 Town Coupe	4,095	7 Town Cabriol.	4,945
7 Sedan	4,245	7 Lim. Brough.	4,945
7 Limousine	4,445		

CADILLAC—V-16, Series 452 B. 143 W. B.
Fisher Bodies

2 Coupe	4,495	2 Roadster	4,595
5 Stan. Sedan	4,595	2 Con. Coupe	4,645

CADILLAC—V-16, Series 452 B. 149 W. B.
Fisher Bodies

5 Stan. Phaeton	4,695	5 Spt. Phaeton	4,945
5 Spec. Phaeton	4,795	5 A. W. Phaeton	5,195

CADILLAC—V-16, Series 452 B. 149 W. B.
Fleetwood Bodies.

5 Sedan	5,095	5 Town Cabriol.	5,795
5 Town Coupe	5,095	7 Town Cabriol.	5,945
7 Sedan	5,245	7 Lim. Brough.	5,945
7 Limousine	5,445		

CHEVROLET—6-cyl. 109 W. B.

Roadster	445	De Luxe Coach	515
Sport Roadster	485	Sport Coupe	535
Standard Coupe	490	5 Coupe	575
Coupe (5 win.)	490	Sedan	590
Phaeton	495	Cabriolet	595
Coach	495	Special Sedan	615
De Luxe Coupe	510	Landau Phaeton	625

CHRYSLER—6-cyl. 116 W. B.

2 Bus. Coupe (5 wire or wood wheels)	865	5 Sedan, 5 wire or wood wheels	895
2-4 Roadster (R.S.) 5 wire or wood wheels	885	5 Phaeton (5 wire wheels	915
2-4 Coupe (R.S.) 5 wire or wood wheels	885	2-4 Con. Coupe, R.S., 5 wire or wood wheels	935
		5 Con. Sedan, 6 wire or wood wheels	1,125

CHRYSLER—8-cyl. 125 W. B.

2-4 Coupe, (R. S.) 5 wire or wood wheels	1,435	2-4 Con. Coupe, (R.S.), 5 wire or wood wheels	1,495
5 Coupe, 5 wire or wood wheels	1,475	5 Con. Sedan, 6 wire or wood wheels	1,695
5 Sedan, 5 wire or wood wheels	1,475		

CHRYSLER IMPERIAL—8-cyl. 135 W. B.

2-4 Coupe, (R. S.) 5 wire or wood wheels	1,925	5 Con. Sedan 6 wire or wood wheels	2,195
5 Sedan, 5 wire or wood wheels	1,945		

CHRYSLER IMPERIAL—8-cyl. 146 W. B.
Custom Models

5 Cl. Cpld. Sedan 6 wire or wood wheels	2,895	7 Sedan Limousine, 6 wire or wood wheels	3,295
7 Sedan, 6 wire or wood wheels	2,995	5 Phaeton, 6 wire or wood wheels	3,395
2-4 Con. Coupe, Roadster, 6 wire or wood wheels	3,295	5 Con. Sedan, 6 wire or wood wheels	3,595

CORD—8-cyl. 137½ W. B.

Sedan	2,395	Cabriolet	2,495
Brougham	2,395	Phaeton Sedan	2,595

DE SOTO—6 cyl. 113 W. B.
Standard Models

2 Buss. Roadster	675	4 Coupe (R. S.)	735
2 Buss. Coupe	695	5 Sedan	775
5 Brougham	695	5 Phaeton	

DE SOTO—6 cyl. 113 W. B.
Custom Models

4 Roadster	775	2-4 Con. Coupe	845
Cus. Coupe	790	5 Con. Sedan	975
5 Sedan	875		

DE VAUX—6-cyl. 114 W. B.

2 Coupe	795	Custom Coupe (R. S.)	895
Stan. Coupe (R. S.)	845	Custom Sedan	895
Stan. Sedan	845	Con. Cust. Coupe	945

DODGE—6-Cyl. 114¼ W. B.
D. L. Models

2 Business Coupe (5 wire wheels, R. M.)	795	2-4 Coupe (R.S.) (6 wood wheels, 2 F. W.)	865
2 Business Coupe (5 wood wheels, R. M.)	795	2-4 Coupe (R.S.) (6 wire wheels, 2 F. W.)	865
2 Business Coupe (5 wire wheels, 1 F. W.)	809.50	5 Sedan (6 Dem. wood wheels, 2 F. W.)	875
2 Business Coupe (5 wood wheels, 1 F. W.)	809.50	5 Sedan (6 wire wheels, 2 F. W.)	875
(6 wire wheels, 2 F. W.)	825	5 Sedan (5 disc wheels, R. M.)	885
2-4 Coupe (R.S.) (5 wire wheels, R. M.)	835	2-4 Con. Coupe (5 wire wheels, R. M.)	895
2-4 Coupe (R.S.) (5 wood wheels, R. M.)	835	2-4 Con. Coupe (6 wire wheels, 2 F. W.)	925
5 Sedan (5 Dem. wood wheels, R. M.)	845	2-4 Con. Coupe (6 wood wheels, 2 F. W.)	925
5 Sedan (5 wire wheels, R. M.)	845		
5 Sedan (5 wire wheels, 1 F. W.)	859.50		

DODGE—8-Cyl. 122 W. B.
D. K. Models

2-4 Coupe (R.S.) 5 wood wheels, R. M.)	1,115	2-4 Coupe (R.S.) (6 wood wheels, 2 F. W.)	1,150
2-4 Coupe (R.S.) (5 wire wheels, R. M.)	1,115	5 Sedan (6 Dem. wood wheels, 2 F. W.)	1,180
5 Sedan (5 Dem. wood wheels, R. M.)	1,145	5 Sedan (6 wire wheels, 2 F. W.)	1,180
5 Sedan (5 wire wheels, R.M.)	1,145	2-4 Con. Coupe	1,185
5 Coupe (5 wire wheels, R.M.)	1,145	5 Coupe (6 wire wheels, 2F.W.)	1,180
2-4 Coupe (R.S.) (6 wire wheels, 2 F. W.)	1,150	5 Coupe (6 wood wheels, 2F.W.)	1,180
		2-4 Con. Coupe (6 wire or wood wheels, 2F.W.)	1,220

ESSEX—6-cyl. 113 W. B.

Business Coupe	695	4 Coupe	745
Coach	705	Standard Sedan	775
Town Sedan	745	Special Coupe	795
Con Coupe		Special Sedan	845

FORD—V-8. 106½ W. B.

Roadster	460	De L. Coupe	575
Coupe	490	Fordor Sedan	590
Phaeton	495	Victoria	600
Tudor Sedan	500	Cabriolet	610
De L. Roadster	500	De L. Fordor Sedan	645
Sport Coupe	535	Con. Sedan	650
De L. Phaeton	545		
De L. Tudor Sedan	550		

FORD— 4-cyl. 106½ W. B.

Roadster	410	De L. Coupe	525
Coupe	440	Fordor Sedan	540
Phaeton	445	Victoria	550
Tudor Sedan	450	Cabriolet	560
De L. Roadster	450	De L. Fordor Sedan	595
Spt. Coupe	485	Con. Sedan	630
Del. Phaeton	495		
De L. Tudor Sedan	500		

FRANKLIN—6-cyl. 132 W. B.
Supercharger Airman

Coupe	2,250	Victoria Brougm.	2,350
5 Sedan	2,250	Speedster	2,450
Con. Coupe	2,295	7 Sedan	2,450
Club Sedan	2,300	Limousine	2,600

FRANKLIN—12-cyl. 144 W. B.

5 Sedan	3,385	7 Sedan	3,985
3-5 Coupe	—	7 Limousine	4,185
4 Vic. Brough.	3,885	4 Speedster	—
3-5 Con Coupe	—		

GRAHAM—6-cyl. 113 W. B.

Town Sedan	765	Sedan	795

GRAHAM—8-cyl. 123 W. B.
Blue Streak—Standard.

2 Coupe	1,095	4 Coupe (R. S.)	1,145
5 Sedan	1,145		

GRAHAM—8-cyl. 123 W. B.
Blue Streak—De Luxe.

2 Coupe	1,170	4 Coupe (R. S.)	1,220
5 Sedan	1,220	4 Con. Coupe	1,270

HUDSON—8-cyl. 119 W. B.
Standard Series

Business Coupe	995	Town Sedan	1,050
Coach	1,025	Stan. Sedan	1,095
4 Coupe	1,045	Special Coupe	1,115

HUDSON—8-cyl. 126 W. B.
Sterling Series

Sur. Sedan	1,275	Special Sedan	1,295

HUDSON—8-cyl. 132 W. B.
Major Series

Touring Sedan	1,445	Club Sedan	1,495
Brougham	1,495	7 Sedan	1,595

HUPMOBILE—216. 6-cyl. 116 W. B.

5 Phaeton	795	Com. Coupe	895
4 Roadster	795	5 Sedan	895
4 Con Cabriolet	895		

HUPMOBILE—222. 8-cyl. 122 W. B.

2 Coupe (RS)	1,295	5 Victoria	1,360
5 Sedan	1,295	5 Cab. Roadster	1,395

HUPMOBILE—226. 8-cyl. 126 W. B.

2 Coupe (RS)	1,595	5 Victoria	1,660
5 Sedan	1,595	2 Cabriolet Road.	1,695

LA SALLE—V-8, Series 345 B. 130 W. B.
Fisher Bodies

2 Coupe	2,395	2 Con. Coupe	2,545
5 Sedan	2,495	5 Town Coupe	2,545

LA SALLE—V-8, Series 345 B. 136 W. B.
Fisher Bodies

5 Town Sedan	2,645	7 Imperial	2,795
7 Sedan	2,645		

LINCOLN—8-cyl. 136 W. B.
Standard Models

2 Roadster	2,900	2 Coupe	3,200
4 Phaeton	3,000	5 Victoria	3,200
Town Sedan (2 win.)	3,100	7 Sedan	3,300
5 Sedan	3,200	7 Limousine	3,350

LINCOLN—12-cyl. 145 W. B.
Standard Models

4 Spt. Phaeton	4,300	4 Spt. Phae. (Tonneau cowl)	4,500
7 Spt. Touring	4,300	5 Sedan	4,600
5 Coupe	4,400	7 Sedan	4,700
4 Town Sedan (2 or 3 win.)	4,500	7 Limousine	4,900

LINCOLN—12-cyl. 145 W. B.
Custom Models

2 Con. Road. (R.S.) Le Baron	4,600	5 Con. Sedan (Dietrich)	6,400
2 Coupe (Dietrich)	5,000	5 Spt. Berline, Dietrich	6,500
2 Coupe (R.S.) Dietrich	5,150	2 Spt. Roadster, Murphy	6,800
2 Coupe, Judkins	5,100	Town Brougham, Willoughby	7,100
2 Coupe (R.S.) Judkins	5,350	7 Brougham, Brunn	7,000
5 Berline, Judkins	5,700	5 Cabriolet (N. C. or S. C.) Brunn	7,200
7 Limousine, Willoughby	5,900	5 Town Cabriolet (Le Baron)	7,400
5 Con. Victoria, Waterhouse	5,900		

MARMON—8-125. 125 W. B.
Standard Models

5 Sedan (5 wire wheels)	1,395	2 Con. Coupe (5 wire wheels)	1,445
2 Coupe (R.S.) (5 wire wheels)	1,395		

MARMON—8-125. 125 W. B.
De Luxe Models

5 Sedan (6 wire wheels)	1,545	2 Con. Coupe (6 wire wheels)	1,595
2 Coupe (R.S.) (6 wire wheels)	1,545		

MARMON—16-Cyl. 145 W. B.

5 Sedan	5,700	2 Con. Coupe	5,850
2 Coupe (R. S.)	5,700	7 Sedan	5,900
5 2-dr. Coupe	5,800	5 Con Sedan	5,950
5 Cl. Cpl. Sedan	5,800	7 Limousine	6,100

NASH BIG SIX—116 W. B.

2 Coupe	777	5 Sedan 4-dr.	840
4 Coupe	825	4 Con. Roadster	895
5 Town Sedan 4-door	825	5 Con. Sedan 2-door	935

NASH STANDARD EIGHT—121 W. B.

2 Coupe	965	5 Sedan 4-dr.	1,015
4 Coupe	1,015	4 Con Roadster	1,055
		5 Con Sedan 2-door	1,095

NASH SPECIAL TWIN IGNITION EIGHT 128 W. B.

2 Coupe	1,270	5 Sedan 4-dr.	1,320
4 Coupe	1,320	5 Victoria	1,395
4 Con. Road.	1,395	5 Con Sedan 4-door	1,475

NASH ADVANCED TWIN IGNITION "8" 133 W. B.

5 Sedan 4-dr.	1,595	5 Victoria	1,785
4 Coupe	1,695	5 Con. Sedan 4-door	1,875
4 Con Roadster	1,795		

NASH AMBASSADOR TWIN IGNITION "8" 142 W. B.

5 Sedan 4-dr.	1,855	7 Sedan	1,955
5 Brougham 4-door.	1,855	7 Limousine	2,055

(Recent price changes in bold face)

OLDSMOBILE—6-cyl. 116½ W. B.
F-32 Models

2 dr. Sedan	875	4 dr. Sedan	955
Bus. coupe	875	Con. Roadster	955
Sport Coupe	925	Patrician Sedan	990

OLDSMOBILE—8-cyl. 116½ W. B.
L-32 Models.

2 dr. Sedan	975	4 Dr. Sedan	1,055
Bus. coupe	975	Con. Roadster	1,055
Sport Coupe	1,025	Patrician Sedan	1,090

PACKARD—8-Cyl. 130 W. B.

5 Sedan	2,250		

PACKARD—8-Cyl. 137 W. B.

7 Touring	2,500	5 Club Sedan	2,775
2 or 4 Coupe	2,595	7 Sedan	2,835
5 Phaeton	2,650	5 Spt. Phaeton	2,950
2-4 Coupe Roadster	2,650	7 Sedan Lim.	2,985
		5 Con. Victoria	3,195
5 Sedan	2,685	5 Con. Sedan	3,250
5 Coupe	2,745		

PACKARD—8-Cyl. 142 W. B.
De Luxe Eight

2-4 Coupe	3,150	5 Club Sedan	3,395
5 Sedan	3,245	7 Touring	3,395
2-4 Coupe Roadster	3,250	5 Spt. Phaeton	3,500
		5 Con. Victoria	3,825
5 Phaeton	3,290	5 Con. Sedan	3,895
5 Coupe (R. S.)	3,350		

PACKARD—8-Cyl. 147 W. B.
De Luxe Eight

7 Sedan	3,495	7 Sedan Lim.	3,695

PACKARD—8-Cyl. 128 W. B.
Light Eight

5 Sedan	1,750	2-4 Coupe Roadster	1,795
5 Coupe Sedan	1,795	2-4 Coupe (R.S.)	1,795

PACKARD—Twin Six—12-Cyl. 142 W. B.

2-4 Coupe	3,650	7 Touring	3,895
5 Sedan	3,745	5 Club Sedan	3,895
2-4 Coupe Roadster	3,750	5 Spt. Phaeton	4,090
		5 Con. Victoria	4,325
5 Phaeton	3,790	5 Con. Sedan	4,395
5 Coupe	3,850		

PACKARD—Twin Six—12-Cyl. 147 W. B.

7 Sedan	3,995	7 Sedan Lim.	4,195

PEERLESS—8-cyl. 125 W. B.
De Luxe Master

5 Sedan	2,320	Club Sedan	2,370
2 Coupe	2,320	Cabriolet	2,430

PEERLESS—8-cyl. 138 W. B.
De Luxe Custom

5 Sedan	2,985	7 Sedan	3,135
5 Club Sedan	3,035	7 Limousine	3,335

PIERCE ARROW—54. 137 W. B.

5 Club Brougham	2,850	5 Club Sedan	3150
5 Sedan	2,985	4 Tourer	3150
4 Coupe	2,985	5 Club Berline	3,350
4 Con. Coupe Roadster	3,100	5 Spt. Phaeton	3,350
		5 Con. Sedan	3,450

PIERCE ARROW—54—142 W. B.

7 Sedan	3,185	7 En. Dr. Limousine	3,450
7 Tourer	3,450		

PIERCE ARROW—53. 137 W. B.

5 Club Brougham	3,650	5 Club Sedan	3,950
5 Sedan	3,785	4 Tourer	3,953
4 Coupe	3,785	5 Club Berline	4,150
4 Con. Coupe Roadster	3,900	4 Spt. Phaeton	4,150
		5 Con. Sedan	4,250

PIERCE ARROW—53. 142 W. B.

7 Sedan	3,985	7 En. Dr. Limousine	4,250
7 Tourer	4,250		

PIERCE ARROW—52. 142 W. B.

5 Sedan	4,295	5 Club Berline	4,600
5 Club Sedan	4,400		

PIERCE ARROW—52. 147 W. B.

7 Sedan	4,535	7 En. Dr. Limousine	4,800

PLYMOUTH—4-cyl. 112 W. B

Buss. Roadster	495	4-dr. 3 win. Sedan	635
Buss. Coupe	563	Con. Coupe	645
Spt. Roadster (R. S.)	595	7 Sedan (121-in. W. B.)	725
Spt. Phaeton	595	Con. Sedan	785
Coupe (R. S.)	610		

PLYMOUTH—4-cyl. *170 O. A. Thrift Models

5 2-dr. Sedan	495	5 4-dr. Sedan	575

PONTIAC—6 cyl. 114 W. B.

2 Stan. Coupe	635	5 4-dr. Sedan	725
5 2-dr. Sedan	645	2 Con. Coupe	765
4 Coupe (R.S.)	715	5 Custom Sedan	795

PONTIAC—V-8. 117 W. B.

2 Stan. Coupe	845	Con. Coupe	945
2 Dr. Sedan	845	4 Dr. Sedan	945
4 Coupe (R.S.)	925	Custom Sedan	1,025

REO—MODEL S—117 W. B.
Flying Cloud

5 Stan. Sedan	995	Stan. Convertible Coupe	1,045
		Coupe	995

REO—6-21. 6-cyl. 121 W. B.

5 Sedan	995		

REO—8-21. 8-cyl. 121 W. B.

5 Sedan	1,195		

REO—8-25. 8-cyl. 125 W. B.

Coupe	1,565	Sedan	1,565
Victoria	1,565		

REO ROYALE—8-cyl. 133 W. B.

Sedan Victoria	1,985	Coupe	1,985

REO ROYALE—8 cyl. 135 W. B.

Sedan	2,445	Con. Coupe	2,445
Coupe	2,445		

ROCKNE—6-65. 6-cyl. 110 W. B.
Standard Models

2 Coupe	585	5 Sedan	635
Coach	595	Conv. Roadster	675
4 Coupe	620	Conv. Sedan	695

ROCKNE—6-65. 6-cyl. 110 W. B.
De Luxe Models

2 Coupe	630	5 Sedan	680
Coach	640	Conv. Roadster	720
4 Coupe	665	Conv Sedan	740

ROCKNE—6-75. 6-cyl. 114 W. B.
Standard Models.

2 Coupe	685	Conv. Roadster	775
4 Coupe	720	Conv. Sedan	795
5 Sedan	735		

ROCKNE—6-75. 6-cyl. 114 W. B.
De Luxe Models.

2 Coupe	730	Conv. Roadster	820
4 Coupe	765	Conv. Sedan	840
5 Sedan	780		

STUDEBAKER—6-cyl. 117 W. B.

2 Coupe	840	4 Regal Coupe	995
4 Coupe	890	5 Regal St. Regis Brougham	1,020
5 St. Regis Brougham	915	5 Regal Sedan	1,020
5 Sedan	915	4 Regal Con. Roadster	1,020
4 Con. Roadster	915	Roadster	1,020
2 Regal Coupe	945	5 Regal Con. Sedan	1,090
5 Con Sedan	985		

STUDEBAKER—8-cyl. 117 W. B
Dictator Models

2 Coupe	980	4 Regal Coupe	1,135
4 Coupe	1,030	5 Regal St. Regis Brougham	1,150
5 St. Regis Brougham	1,050	5 Regal Sedan	1,155
5 Sedan	1,050	4 Regal Con. Roadster	1,155
4 Con. Roadstr.	1,050	Roadster	1,155
2 Regal Coupe	1,085	5 Regal Con Sedan	1,230
5 Con. Sedan	1,125		

STUDEBAKER—8-cyl. 125 W. B.
Commander Models

4 Coupe	1,350	5 Regal Sedan	1,550
4 Con. Roadstr.	1,445	4 Regal Con. Roadster	1,550
5 Sedan	1,445	5 Con. Sedan	1,560
5 St. Regis Brougham	1,445	5 Regal Con. Sedan	1,665
4 Regal Coupe	1,455		
5 Regal St. Regis Brougham	1,550		

STUDEBAKER—8-cyl. 135 W. B.
President Models

4 Coupe	1,690	4 State Con. Roadster	1,855
5 St Regis Brougham	1,750	5 Con Sedan	1,840
5 Sedan	1,750	7 Sedan	1,890
4 Con. Roadstr.	1,750	5 State Con. Sedan	1,985
4 State Coupe	1,795	7 Limousine	1,990
5 State St. Regis Brougham	1,855	7 State Sedan	1,995
5 State Sedan	1,855	7 State Limous	2,095

STUTZ—6-cyl. 127½ W. B
LAA Series

5 Sedan	1,520	2 Coupe	1,620
5 Coupe	1,620	Club Sedan	1,620

STUTZ—8-cyl. 134½ W. B.
SV-16 Standard

5 Coupe	2,695	2 Coupe	2,995
5 Sedan	2,995	Club Sedan	3,095

**STUTZ—8-cyl. 134½